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Feb. 1957 / Specialty Certification Number
Neurovascular factors in disease

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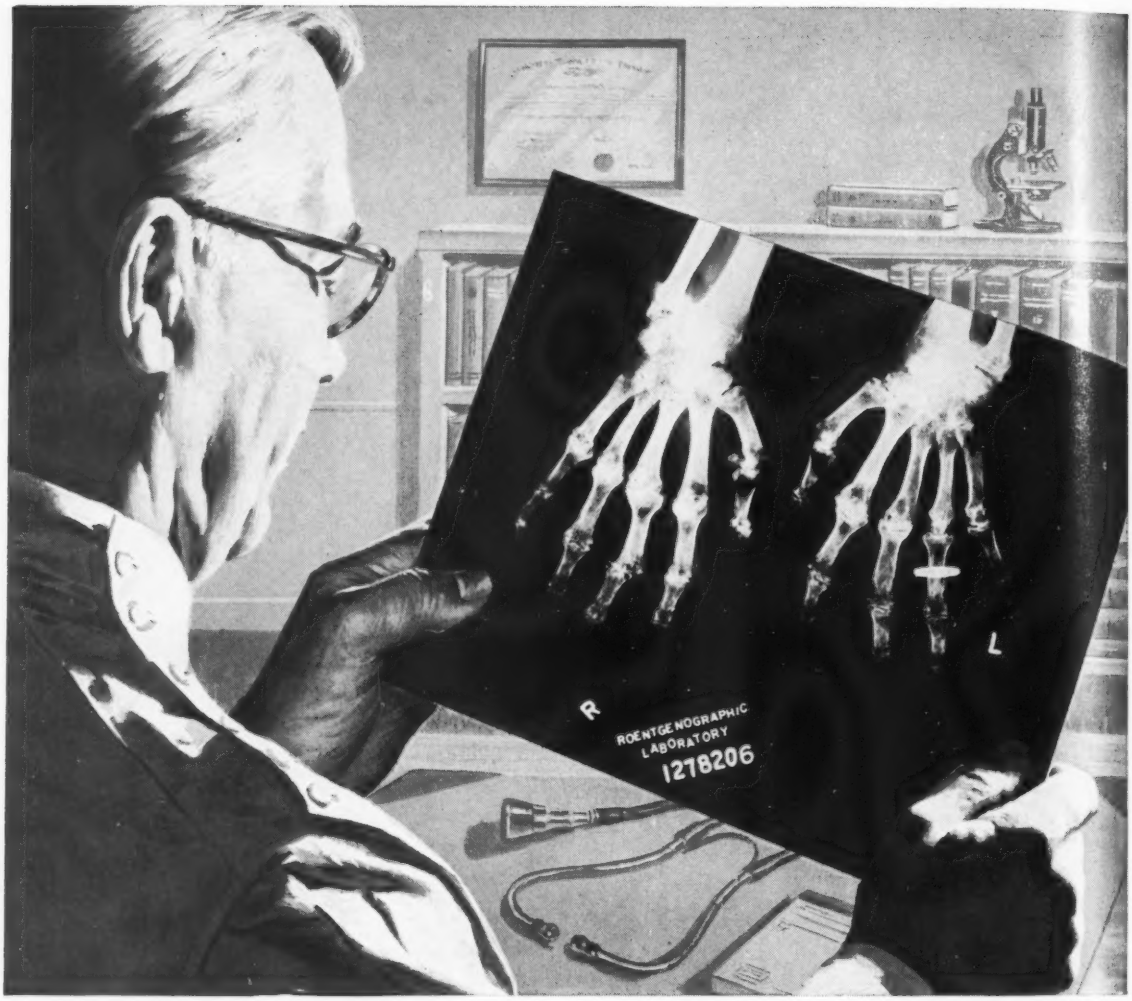

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1. J.A.M.A. 159:645 (Oct. 15) 1955.
2. J.A.M.A. 158:386 (June 4) 1955.

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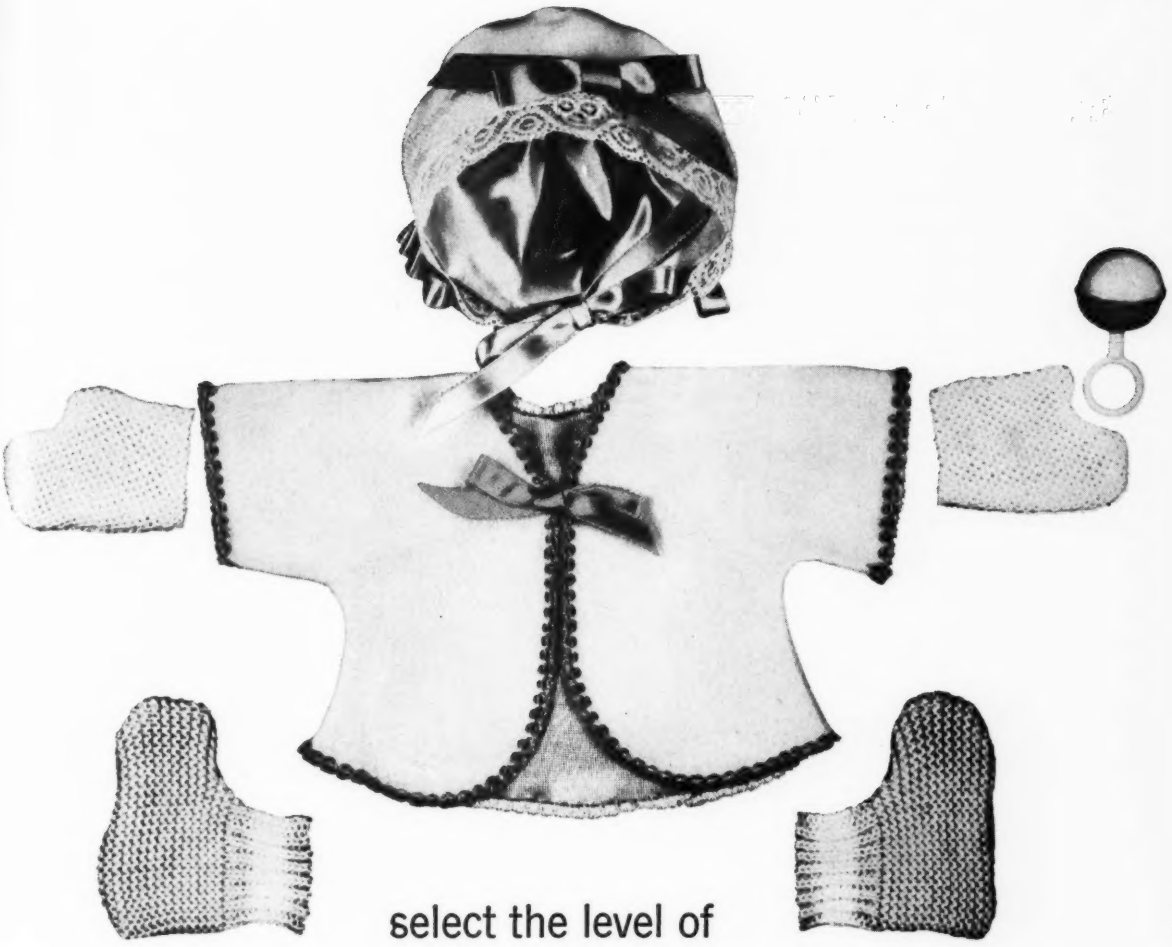

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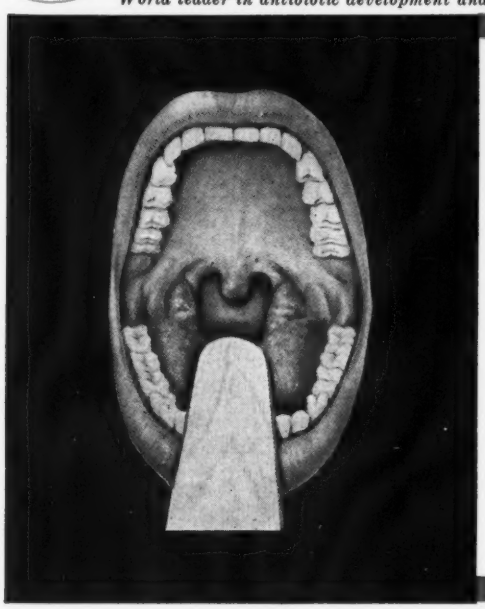

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1. Carter, C. H., and Maley, M. C.: Antibiotics Annual 1956-1957, New York, Medical Encyclopedia, Inc., 1957, p. 51.

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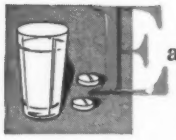

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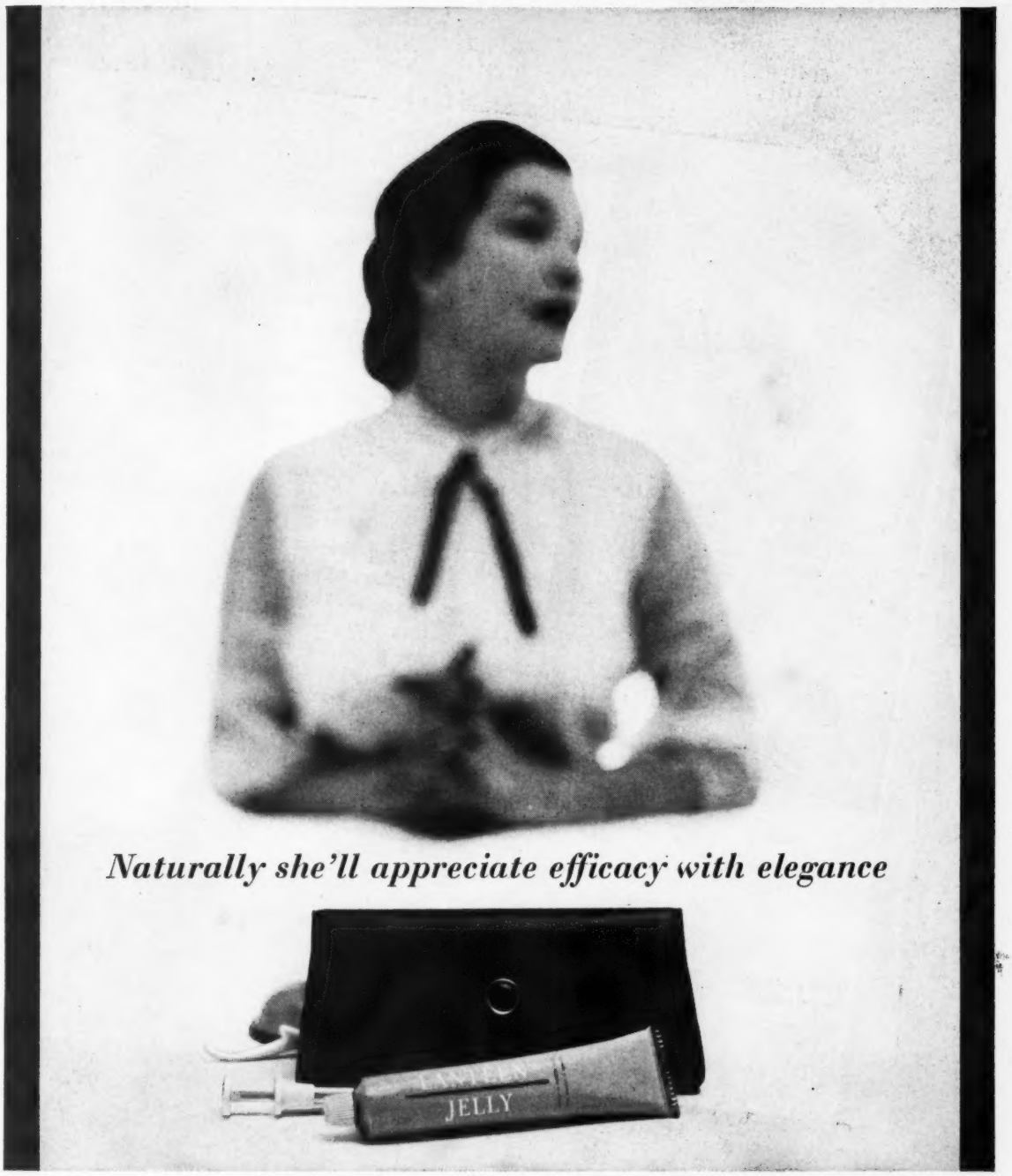

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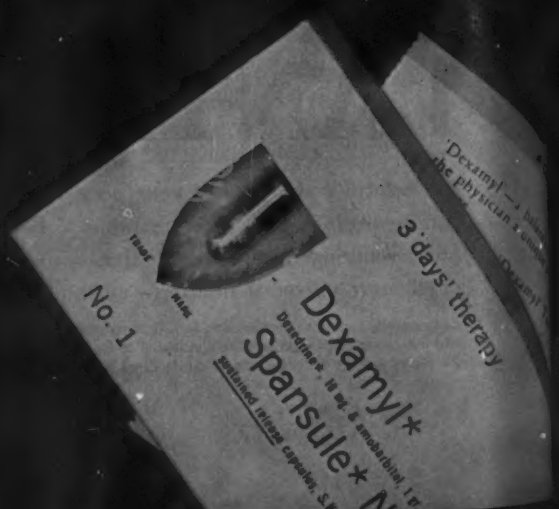

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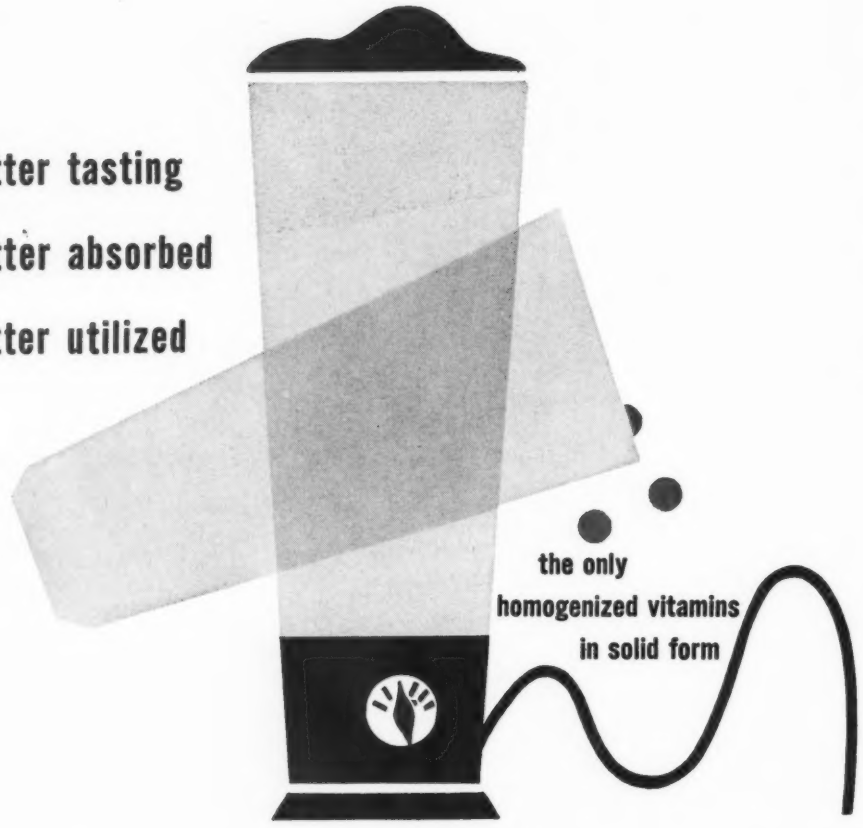

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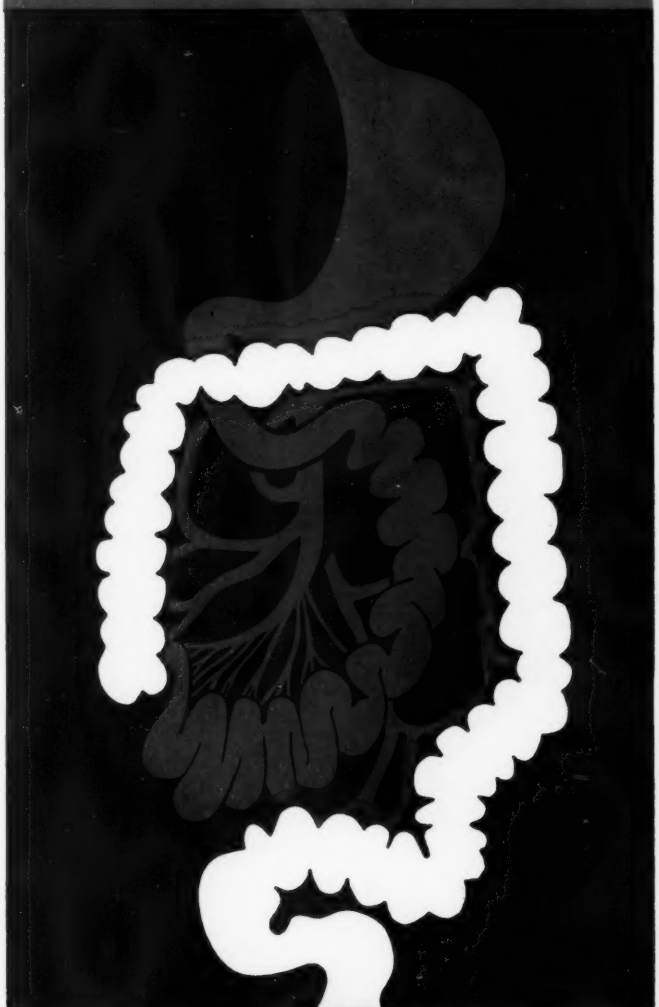

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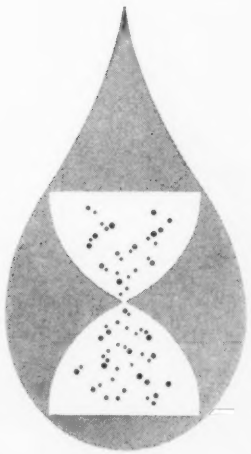

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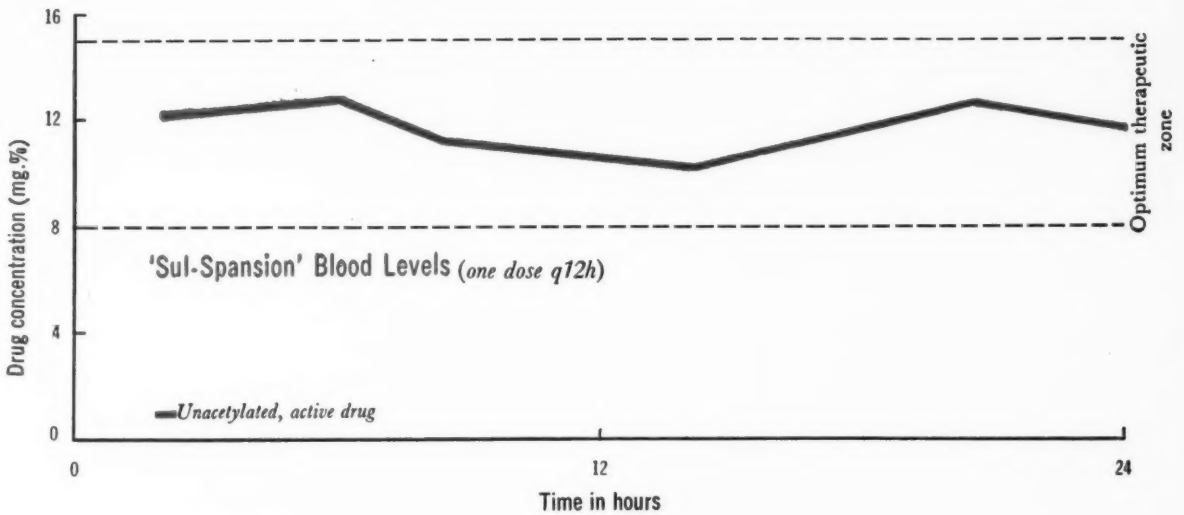

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After 'Compazine' 5 mg. q.i.d., this severe case[1] of nausea and vomiting of pregnancy showed " . . . almost immediate response."

In fact, the physician reports, "She hasn't had any nausea or vomiting since then and she has not had the drug for three weeks."

'Compazine' is a potent new antiemetic that has shown 86% favorable results in the treatment of nausea and vomiting of pregnancy. In over 12,000 patients, treated with 'Compazine' before introduction, side effects were infrequent, minimal and transitory.

Compazine★

a potent new antiemetic for everyday practice

Smith, Kline & French Laboratories, Philadelphia

1. Personal communication to S.K.F.

★Trademark for proclorperazine, S.K.F.

NEOBON®

TO FIGHT THE INROADS OF AGE

Current opinion stresses the importance of early recognition of the undesirable effects of aging, and adequate metabolic support of the body's fight against them.[1] NEOBON, by providing 4 factors PLUS 1, corrects all 5 of the recognized treatable causes of aging.

Gonadal Hormone Decline—NEOBON'S daily dose of 3 mg. Methyltestosterone and 0.018 mg. Ethinyl Estradiol offsets it.

Hematinic Deficiencies—NEOBON combats nutritional anemia and iron deficiency with essential hematinic factors.

Digestive Enzyme Deficiency—NEOBON supplies pepsin and pancreatin to insure proper absorption and utilization of foods—despite digestive "let-down" of aging.

Nutritional Inadequacy—NEOBON'S complete combination of essential minerals and vitamins replaces deficiencies inherent in the restricted diets of the aging.

PLUS—NEOBON'S new lysine, the amino acid that lifts low value vegetable proteins to the high grade quality found in meat and eggs.

NEOBON in bottles of 60 soft, soluble capsules; prescription only.

1. Klemme, H. L.: Clin. Med., October, 1956.

NEW NEOBON® LIQUID, *a geriatric tonic providing gonadal and thyroid supplementation, improved carbohydrate and protein utilization, hematinic action, and mild antidepressant effect.*

In 16 oz. bottles; prescription only.

PEACE of mind ATARAX®

Chicago 11, Illinois

prescribe RAUDIXIN to break the mental tension—hypertension cycle

*Raudixin reduces mental tension

Tranquilizing Raudixin reduces the mental tension which plays a significant role in hypertension . . . reduces mental tension as yet unrelated to physical symptoms.

*Raudixin reduces hypertension

Blood pressure lowering effect is gradual, sustained in hypertensives . . . little or no hypotensive effect is produced in normotensives.

*Single daily dosage

Discourages promiscuous over-use by patients . . . not habit-forming.

RAUDIXIN

Squibb Whole Root Rauwolfia Serpentina

SQUIBB *Squibb Quality—the Priceless Ingredient*

*"RAUDIXIN" IS A SQUIBB TRADEMARK

NEW! *More Effective...*

Medihaler-Phen™

Each cc. provides phenylephrine HCl 3.6 mg., neomycin sulfate 1.5 mg. (equivalent to 1 mg. of neomycin base), and hydrocortisone 0.6 mg., in 10 cc. leakproof, spillproof vials with metered-dose valve and sterilizable unbreakable plastic nasal adapter.

Unvarying Measured-Dose Nasal Medication Reaching the Entire Paranasal Mucosa

VASOCONSTRICTIVE Counteracts hyperemia of nasal and paranasal mucosa

DECONGESTIVE Diminishes edema and hypersecretion . . . opens sinus ostia

ANTI-INFLAMMATORY Neutralizes the exudative phase of tissue reaction

ANTIBIOTIC Attacks bacterial invasion directly

Medihaler-Phen™ . . . an ethical prescription item . . .

makes squeeze bottle and dropper medications obsolete

Medihaler-Phen is self-powered, measured-dose vaporized medication providing effective relief for congested nasal and paranasal mucosa.

Its active ingredients—phenylephrine HCl, hydrocortisone, and neomycin sulfate—are in wide clinical use. In Medihaler-Phen, for the first time, they are blended with an inert, nontoxic aerosol propellent, and are made more effective with a penetrating surfactant. An accurately-measured nebular cloud is gently ejected, regardless of how the Medihaler-Phen valve is compressed—not part spray, part stream as with spray bottles—not an irritating, powerful jet—no drops of liquid which tend to run out of the nasal passages.

Because of the extremely small, uniform particle size of Medihaler-Phen nebulization, less medication is required to decongest the mucosa and open the ostia of paranasal sinuses.

Longer Lasting Relief in Nasal Congestion

RHINITIS
SINUSITIS
PHARYNGITIS

due to upper respiratory infections and allergies

tissue compatible
greater effectiveness
longer lasting
no rebound
vest pocket size

Medihaler-Phen™ is Safe

...FOR CHILDREN, TOO

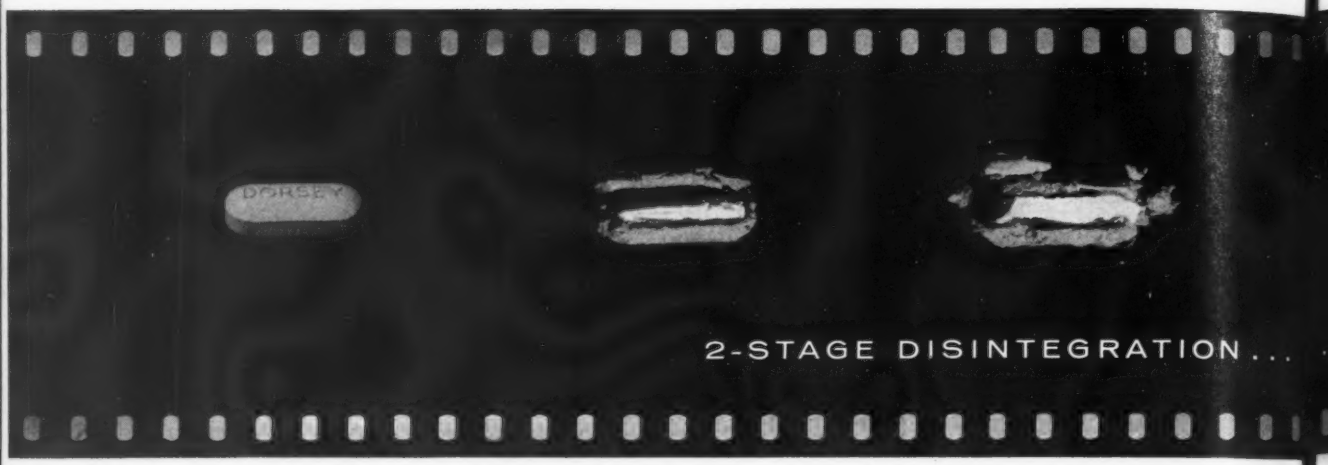
Repeated use does not result in tachyphylaxis. . . . Does not possess the cardiac and nervous system-stimulating actions characteristic of other topical vasoconstrictors. . . . Even gross overdosage does not lead to drowsiness or deep somnolence in children. . . . Concentration of hydrocortisone effective locally, but produces no systemic effect. . . . Penetrates "mucous blanket" of nasal mucosa without irritation.

OTHER USES Medihaler-Phen is also valuable in the symptomatic treatment of "postnasal drip" due to excessive smoking, air pollution, steam heating, etc.

ANOTHER Riker FIRST

New...improved salicylate therapy

in a TANDEM RELEASE tablet



The outer layer of Buffered Pabirin Tablets quickly releases aluminum hydroxide for buffering action. PABA to potentiate acetylsalicylic acid and therapeutic doses of ascorbic acid to offset depletion are also in the outer layer.

The inner core of Buffered Pabirin Tablets containing acetylsalicylic acid alone begins to expand after the buffering action has started.

Arthritic patients—the very patients who need salicylate therapy most—are also the ones least able to tolerate salicylates over prolonged periods without gastric distress. This problem is now solved by the new Buffered Pabirin Products. The protective antacid (aluminum hydroxide) buffers against gastric irritation. PABA and the antacid potentiate acetylsalicylic acid and rapidly create high, sustained blood levels with low salicylate dosage...higher than with PABA or buffers alone. Studies show that high salicylate plasma levels promote an increase in production of adrenal cortical hormones.

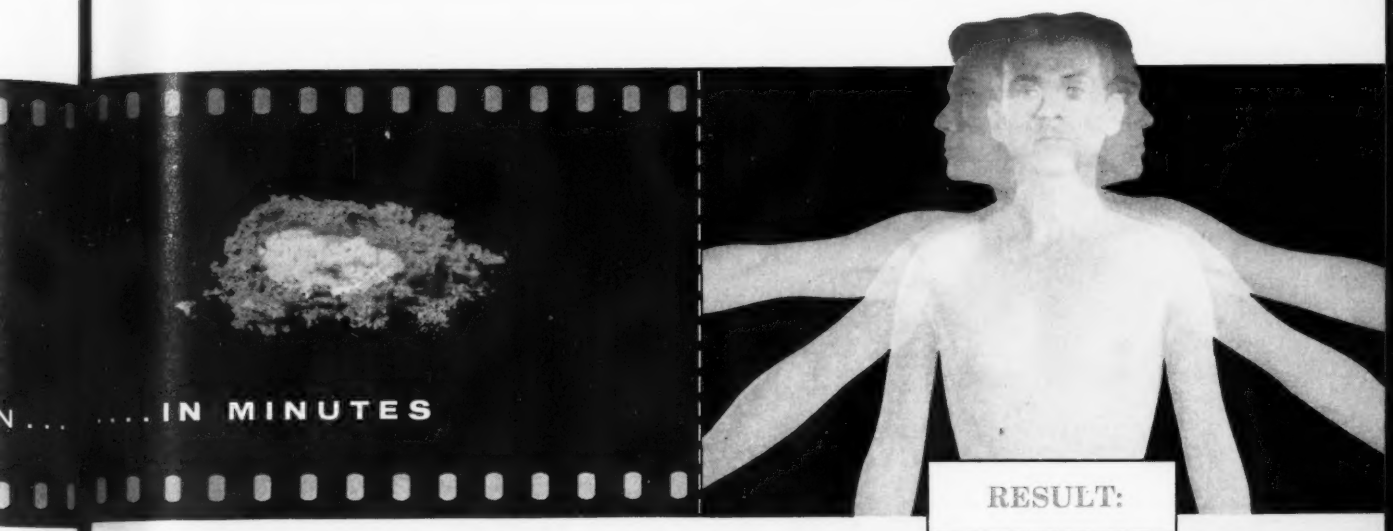
For resistant rheumatics, Buffered Pabirin AC Tablets provide the added benefits of hydrocortisone. The use of hydrocortisone with acetylsalicylic acid reduces corticoid dosage to minimize the danger of adrenal atrophy. And PABA retards breakdown of hydrocortisone by the liver thereby prolonging its effect.

Buffered Pabirin and Buffered Pabirin AC Tablets are both sodium and potassium free.

SMITH-DORSEY • Lincoln, Nebraska • a division of The Wander Company

☆ buffered for superior gastric tolerance

☆ buffered for faster pain relief



The inner core then disintegrates rapidly and permits fast absorption of the acetylsalicylic acid.

Buffered Pabirin AC Tablets release, in addition, hydrocortisone from the core.

- **increased range of motion**
- **faster pain relief**
- **superior gastric tolerance**

for most rheumatoid arthritics

Buffered Pabirin®
TABLETS

—	Hydrocortisone	2.5 mg.
300 mg.	Acetylsalicylic acid (5 gr.)	300 mg.
300 mg.	Para-aminobenzoic acid (5 gr.)	300 mg.
50 mg.	Ascorbic acid	50 mg.
100 mg.	Dried aluminum hydroxide gel	100 mg.

Dosage: Two or three tablets 3 or 4 times daily. In rheumatic fever three to five tablets 4 or 5 times daily.

for resistant rheumatics

Buffered Pabirin® AC
TABLETS

Dosage: Initially, one or two tablets 4 times daily, after meals and on retiring. Reduction of dosage should be gradual; never stopped abruptly.

Erythromycin in Treating Pneumonia

A 27-year-old man, a chronic alcoholic, was admitted with a history of an alcoholic spree followed by a cough, greenish sputum and chills and fever.

Physical examination showed a temperature of 104 F. and indicated pneumonia in the right lower lobe. This was confirmed by X-ray. The sputum revealed gram-positive diplococci and blood culture subsequently grew Type VII pneumococci.

The patient was treated with erythromycin, 300 mg. every six hours per os. His temperature dropped to normal by 48 hours and X-ray of the chest revealed considerable clearing by the fourth hospital day. After 10 days hospitalization, the patient was fit for discharge.[1]

First Antibiotics Symposium, we reported the successful treatment with hromycin of *H. influenzae* pneumonia and bacteremia. A second patient with *H. influenzae* pneumonia and bacteremia had a clinical course almost identical to the one previously reported, with cure obtained by treatment with 500 mg. of erythromycin per os every four hours for 14 days.

Of these 132 patients with bacterial pneumonia, 127 (96%) had a good clinical result. One patient with lobar pneumonia had a good initial response but had delayed resolution after treatment.

"Highly Effective in Pneumonia"

In one investigation, 75 adult patients with bacterial pneumonia were treated with erythromycin. In his summary, the clinician reported: "It is concluded that erythromycin is highly effective in the treatment of pneumonia due to gram-positive bacteria."[2]

This, of course, is only one of many reports showing the effectiveness of ERYTHROCIN against coccic infections. You'll get the same good results (nearly 100% in common, bacterial respiratory infections) when you prescribe ERYTHROCIN. Abbott

filmtab®

Erythrocin®

(Erythromycin, Abbott)

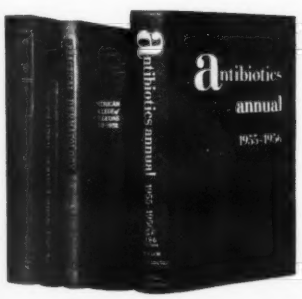
STEARATE

"No Serious Side Effects Occurred"

After a study of 171 patients treated with erythromycin, the investigator wrote: "No serious side effects occurred with prolonged therapy or with doses up to 8 Gm. per day in the severe infections."[1]

Actually, ERYTHROCIN stands on a remarkable record of safety. After four years, there's not a single report of a severe or fatal reaction attributable to erythromycin. In addition, you'll find allergic manifestations rarely occur. *Filmtab* ERYTHROCIN Stearate (100 and 250 mg.), in bottles of 25 and 100. Abbott

® Filmtab—Film-Sealed tablets, Abbott; pat. applied for.



1. Romansky, M.J., et al., Antibiotics Annual 1955-1956, p. 48,
2. Waddington, W. S., Maple, F. C., and Kirby, W. M. M., A.M.A. Archives of Internal Medicine, 1954, p. 556.

701051

Most doctors feel it is wisest to continue the infant's evaporated milk formula for six months, adjusting it from time to time to meet his changing needs. Evaporated milk processing makes it easier to digest than fresh milk. This is an important point, since digestive upsets and diarrheas are both more difficult to treat and potentially more serious during infancy.

During baby's important first six months, you can count on the *known digestibility* of his individual evaporated milk formula to give him basic growth protection. It is far wiser to give baby this protection than to try to turn him into an adult too early!

Carnation

"FROM CONTENTED COWS"

Optimum prescription-quality in today's trend to the individual formula.

A new antibacterial

with double-spectrum action

plus a high degree of safety

Gantrimycin

'ROCHE'

Why is Gantrimycin so effective? Because it provides Gantrisin plus oleandomycin (a new antibiotic) which mutually reinforce each other; and there is a high degree of safety plus a pronounced effect on most pathogens resistant to other antibiotics.

The double-spectrum action of Gantrimycin is valuable against both gram-positive and gram-negative microorganisms.

Dosage: Adults—2 to 3 tablets, four times daily; should be increased to 4 or 5 tablets, four times daily, if necessary. Children over 30 lbs—1 or 2 tablets, four times daily. Children under 30 lbs—1 tablet, four times daily.

Each blue Gantrimycin tablet contains 333 mg Gantrisin and 75 mg oleandomycin.

Gantrisin®; Gantrimycin™

HOFFMANN-LA ROCHE INC • Nutley 10 • New Jersey

Announcing
a new
antibacterial
with
double-spectrum
action—

Rauwiloid®

A Better Antihypertensive

. . . because among all Rauwolfia preparations Rauwiloid (alseroxylon) is maximally effective and maximally safe . . . because least dosage adjustment is necessary . . . because the incidence of depression is less . . . because up to 80% of patients with mild labile hypertension and many with more severe forms respond to Rauwiloid alone.

A Better Tranquilizer, too

. . . because Rauwiloid's *nonsoporific* sedative action relieves anxiety in a long list of unrelated diseases not necessarily associated with hypertension . . . without masking of symptoms . . . without impairing intellectual or psychomotor efficiency.

Dosage: Simply two 2 mg. tablets at bedtime. After full effect one tablet suffices.

Best first step when more potent drugs are needed

Rauwiloid is recognized as basal medication in all grades and types of hypertension. In combination with more potent agents it proves synergistic or potentiating, making smaller dosage effective and freer from side actions.

Rauwiloid®+Veriloid®

In moderate to severe hypertension this single-tablet combination permits long-term therapy with dependably stable response. Each tablet contains 1 mg. Rauwiloid and 3 mg. Veriloid. Initial dose, 1 tablet t.i.d., p.c.

Rauwiloid®+ Hexamethonium

In severe, otherwise intractable hypertension this single-tablet combination provides smoother, less erratic response to hexamethonium. Each tablet contains 1 mg. Rauwiloid and 250 mg. hexamethonium chloride dihydrate. Initial dose, ½ tablet q.i.d.

Riker LOS ANGELES

NOW AVAILABLE

flexin®

(Zoxazolamine,* McNeil)

engestic® coated
(ENTERIC)

PROMPT RELIEF IN LOW BACK PAIN

With FLEXIN, "...17 of the 20 patients with post-traumatic muscle spasm of the low back had excellent or good responses."[1]

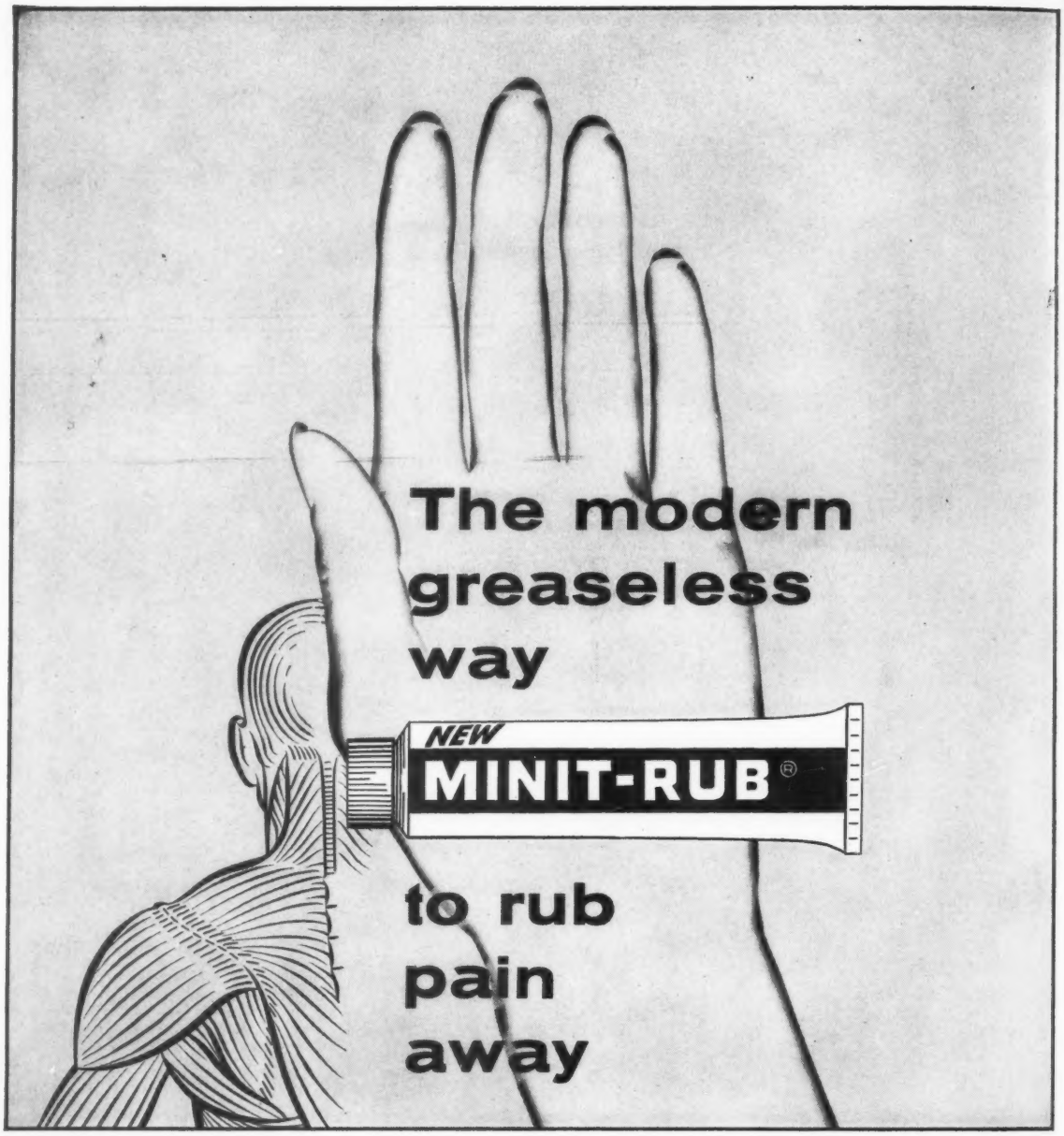
AVAILABLE: Tablets, Engestic Coated, pink, 250 mg., bottles of 36.
Tablets, scored, yellow, 250 mg., bottles of 50.

1. Wallace, S. L.: Zoxazolamine (Flexin) in Low Back Disorders, to be published.

*U.S. Patent Pending

08057

McNEIL Laboratories, Inc · Philadelphia 32, Pa.



When the problem is rheumatic or arthritic pain, MINIT-RUB® brings comfortable relaxation the easy, greaseless way. This counter irritant heat is an excellent adjunct to systemic arthritic therapy.

The week-end enthusiast who sporadically overworks his muscles needs help *fast*. MINIT-RUB brings deep, warming relief.

For colds, MINIT-RUB applied to the chest relieves soreness and congestion; inhaled it reduces stuffiness.

On "footsore" days, a little MINIT-RUB briskly applied to insteps and arches is bracing to tired feet.

Bristol-Myers Co., 19 West 50 Street, New York 20, New York

Pfizer

a *new* alkaloid of rauwolfia–rescinnamine–for improved control of hypertension and tension...

- *the safer, better-tolerated antihypertensive and tranquilizing agent*
- *side effects are less frequent and less pronounced*

Tablets: *0.25 mg., 0.5 mg.*

unwind patients gently with new **MODERIL***

BRAND OF RESCINNAMINE *Trademark

PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y.

relaxes both mind and muscle

for the average patient in everyday practice

- well suited for prolonged therapy
- well tolerated, nonaddictive, essentially nontoxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: **anxiety and tension states, muscle spasm.**

THE ORIGINAL MEPROBAMATE

Miltown®

Tranquilizer with muscle-relaxant action

DISCOVERED AND INTRODUCED

BY WALLACE LABORATORIES, *New Brunswick, N.J.*

2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720

SUPPLIED: *400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.*

Literature and Samples Available on Request

THE MILTOWN MOLECULE

CM-3664-R2

two
patients
with
angina pectoris

...your treatment can make *the difference*

In angina pectoris: ". . . the difference between complete, or almost complete, absence of symptoms, or a prolonged illness with much suffering" may lie in routine prophylaxis with Peritrate.[1]

New studies continue to confirm the effectiveness of this long-acting coronary vasodilator. "Impressive and sustained improvement" is observed in patients on Peritrate therapy.[2]

Simple prophylaxis: Peritrate is not indicated to abort the acute attack (nitroglycerin is still the drug of choice). However, you can reduce or eliminate nitroglycerin dependence and provide continuing protection against attacks of angina pectoris with Peritrate. Prophylaxis is simple: 10 or 20 mg. of Peritrate *before meals* and at bedtime. Maintenance of a continuous daily dosage schedule is important for successful therapy.

Peritrate has been demonstrated to prevent or reduce the number of attacks, lessen nitroglycerin dependence, improve abnormal EKG findings and increase exercise tolerance.[3,4,5]

The specific needs of most patients and regimens are met with Peritrate's five dosage forms: Peritrate 10 mg. and 20 mg. tablets; Peritrate Delayed Action (10 mg.) for continuous protection through the night; Peritrate with Phenobarbital (10 mg. with phenobarbital 15 mg.) where sedation is required; Peritrate with Aminophylline (10 mg. with aminophylline 100 mg.) in cardiac and circulatory insufficiency.

Usual Dosage: 10 to 20 mg. *before meals* and at bedtime.

References: **1.** Rosenberg, H. N., and Michelson, A. L.: Am. J. M. Sc. *230*:254 (Sept.) 1955. **2.** Kory, R. C., *et al.*: Am. Heart J. *50*:308 (Aug.) 1955. **3.** Winsor, T., and Humphreys, P.: Angiology *3*:1 (Feb.) 1953. **4.** Plotz, M.: New York State J. Med. *52*:2012 (Aug. 15) 1952. **5.** Dailheu-Geoffroy, P.: L'Ouest-Médical, vol. 3 (July) 1950.

Peritrate®

(brand of pentaerythritol tetranitrate)

WARNER-CHILCOTT

Good recovery reports travel far...

Gomco No. 789 Aspirating Pump keeping patient's throat clear during post-operative period. Weighing only 16 lbs., it is a favorite for floor use. Supported here by Gomco No. 816 Stand.

Adequate aspiration is one of those facilities which leave a good impression in the patient's mind, because of the comfort and ease of breathing it affords him. That calls for steady, power-controlled aspiration *when* — *where* — and *as long as it's needed.*

That's why so many hospitals, clinics and physicians specify GOMCO Aspirators. They can depend on them. You can depend on them, too, because they are built to a standard of craftsmanship that tolerates no flaws.

Have your dealer show you the complete line of GOMCO Aspirators and suction-ether units that have been fostering good results for over 25 years!

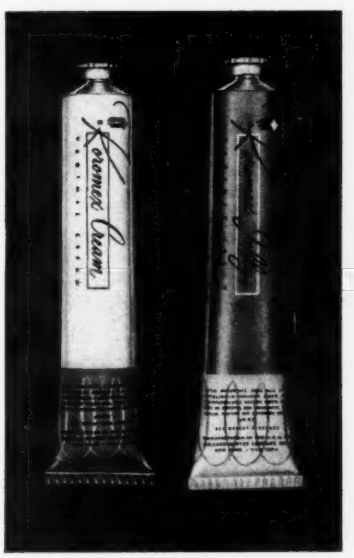
GOMCO SURGICAL MANUFACTURING CORP. 830-M E. Ferry Street, Buffalo 11, N.Y.

This is a doctor. We know the toils of his education dedicate him to his daily work. We also know that his work is varied, complex, and always demands a broad personal and infinitely professional approach. His may be a rewarding chore... but it's a most trying one. Above all, his responsibility is the restoration and preservation of the health of those who seek his help.

It is for these men that we devote intensive research and study techniques to provide for them the finest conception control products. History indicates... if product demand is an index... that ours assure consistently more effective results*. We're pleased that doctors of America have proven this.

That's why they rely on and recommend... *Koromex*

*Factual literature sent on request.



AVAILABLE AT ALL LEADING PHARMACIES • KOROMEX JELLY, CREAM AND DIAPHRAGM COMPACT
HOLLAND-RANTOS COMPANY, INC. • 145 HUDSON STREET • NEW YORK 13, N. Y.

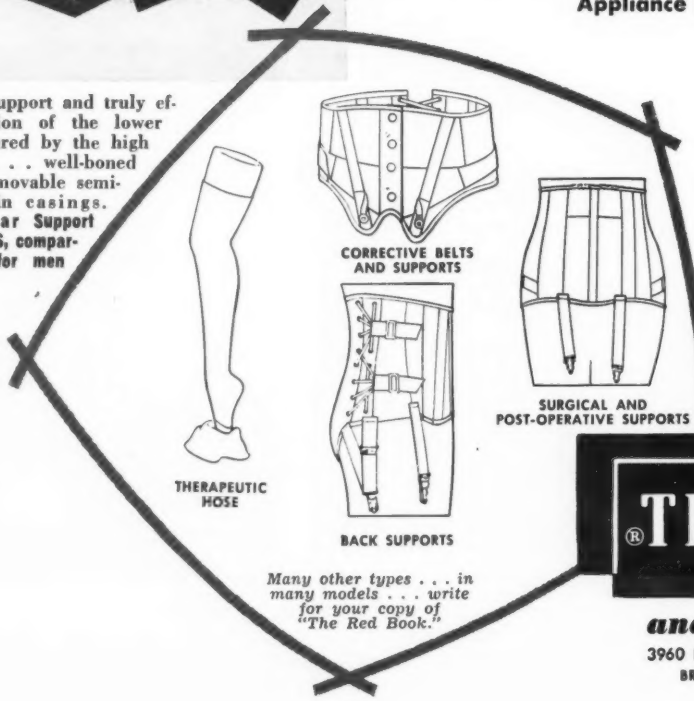
effective FIXATION

Anatomically correct . . . therapeutically sound . . . these principles are designed in, and built in, each Truform appliance.

Effective support or effective fixation . . . this you can depend on when you prescribe "Truform." Your patient benefits from the most careful selection and skillful fitting because . . .

- **TRUFORM Anatomical Supports are available only from the Ethical Appliance Dealer**

Very rigid support and truly effective fixation of the lower spine is assured by the high solid back . . . well-boned and with removable semi-rigid stays in casings. Sacro-Lumbar Support Model 1165-HS, comparable model for men 447-HS.



Many other types . . . in many models . . . write for your copy of "The Red Book."

®TRUFORM

anatomical supports

3960 ROSSLYN DRIVE, CINCINNATI 9, OHIO

BRANCHES: New York and San Francisco

softens the stool and stimulates peristalsis **DORBANTYL***

new and unique evacuant

unique, new DORBANTYL combines Dioctyl Sodium Sulfosuccinate—the wetting agent that helps form a normal, easily-passed stool,[1,2,3] and

DORBANE—widely prescribed, dependable peristaltic stimulant[4]

unique, new DORBANTYL is both safe and effective—"...a superior evacuant which retains the advantages of both component drugs without the disadvantages of either used alone."[1]

unique, new DORBANTYL is clinically described as a "preparation of choice" in anorectal and colonic surgery, as well as in functional constipation and cathartic habituation.[1]

dosage: 2 capsules at bedtime; repeat if necessary. Dosage may be varied to meet individual need. Children, 3 to 12 years, 1 or 2 capsules as above.

supplied: Bottles of 30 and 250 capsules, each containing 50 mg. dioctyl sodium sulfosuccinate and 25 mg. Danthron (DORBANE) for *flexible* dosage.

references: (1) Marks, M. M.: In press. (2) Antos, R. J.: Southwestern Med. *37*:236, 1956. (3) Wilson, J. L., and Dickinson, D. G.: J.A.M.A. *158*:261 (May 28) 1955. (4) Marks, M. M.: Am. J. Digest. Dis. *20*:240, 1953.

in occasional constipation or for more rapid response prescribe

DORBANE® **peristaltic stimulant**

selective, persuasive, crystalline-pure

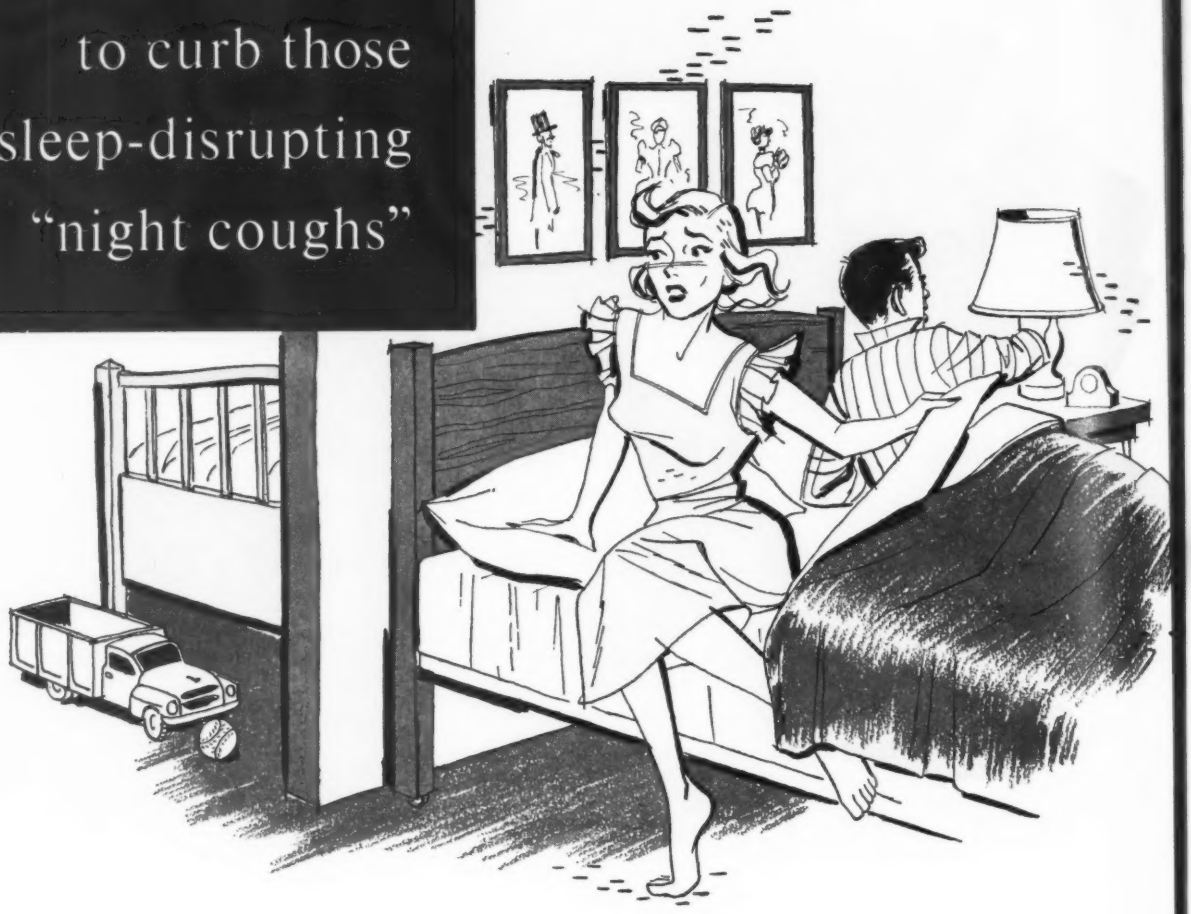
DORBANE scored tablets (75 mg.) and
DORBANE orange-flavored suspension (37.5 mg. per 5-cc. tsp.).

DORBANE IS THE REGISTERED TRADEMARK OF SCHENLEY LABORATORIES, INC., FOR ITS BRAND OF DANTHRON.
*DORBANTYL IS THE TRADEMARK OF SCHENLEY LABORATORIES, INC., FOR ITS BRAND OF DANTHRON WITH DIOCTYL SODIUM SULFOSUCCINATE.

Schenlabs SCHENLEY LABORATORIES, INC · NEW YORK 1, N.Y.

44386

to curb those
sleep-disrupting
"night coughs"



that waken the whole household...

CLISTIN® EXPECTORANT

Clistin Expectorant is the only cough product containing Clistin—that well-accepted, potent antihistamine. Relieves coughs of the common cold and coughs of allergic or non-allergic upper respiratory conditions.

Clistin Expectorant—samples on request

McNEIL
LABORATORIES, INC.
Philadelphia 32, Pa.

"anti-cough"...

antihistaminic...

completely safe for pediatric use...

non-narcotic...

does not upset the stomach...

tastes wonderful

A "re-view" of iron therapy

LIVITAMIN®

with peptonized iron

for dependable

hemopoietic response

It is well-established that peptonized iron is virtually predigested. Anemias refractory to other forms of iron will often respond promptly to Livitamin. And the Livitamin formula, containing the B complex, provides integrated therapy to correct the blood picture, and to improve appetite and digestion.

Current studies* show Peptonized Iron

—One-third as toxic as ferrous sulfate.
—Absorbed as well as ferrous sulfate.
—Non-astringent.
—Free from tendencies to disturb digestion. (One-tenth as irritating to the gastric mucosa as ferrous sulfate.)
—Highly effective in iron-deficiency anemias.

*Keith, J.H.: Utilization and Toxicity of Peptonized Iron and Ferrous Sulfate. Read before the American Association for the Advancement of Science, Atlanta, Georgia, December, 1955

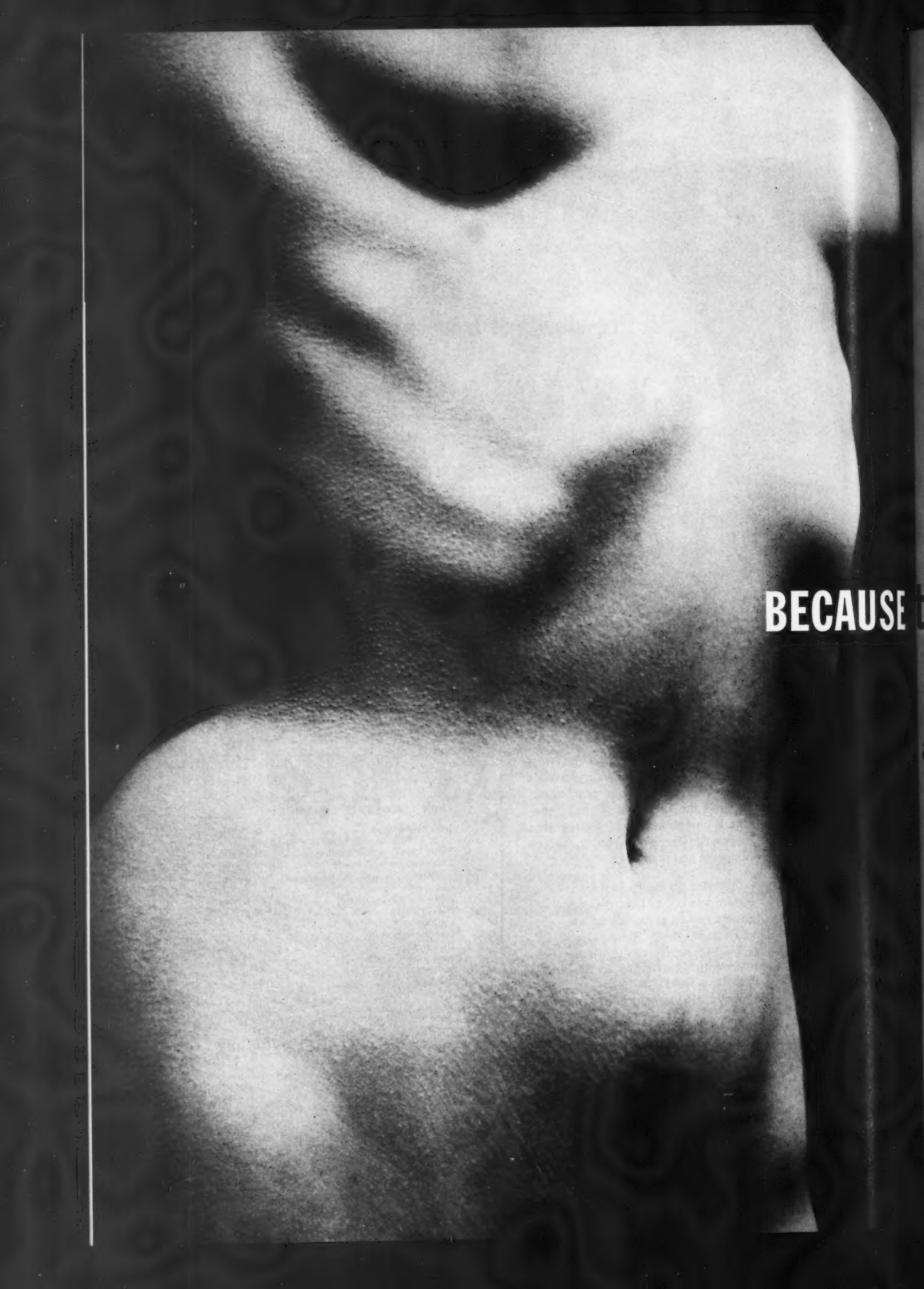
EACH FLUIDOUNCE CONTAINS:

Iron peptonized (Equiv. in elemental iron to 71 mg.)	0.42 Gm.
Manganese citrate, soluble	0.158 Gm.
Thiamine hydrochloride	10 mg.
Riboflavin	10 mg.
Cobalamin Conc. (Vitamin B_{12} activity)	20 mcg.
Niacinamide	50 mg.
Pyridoxine hydrochloride	1 mg.
Pantothenic acid	5 mg.
Liver fraction 1	2 Gm.
Rice bran extract	1 Gm.
Inositol	30 mg.
Choline	60 mg.

The S. E. MASSENGILL Company

Bristol, Tennessee

New York Kansas City San Francisco


BECAUSE

USE

there's no acid rebound

and it acts within seconds...
keeps patients comfortable for hours
and tastes good month after month...

TITRALAC®

unique antacid
—with milk-like action

Each non-chalky, minty-tasting, white tablet (0.60 Gm.) contains 0.18 Gm. glycine and 0.42 Gm. calcium carbonate.

is being prescribed by more and more physicians

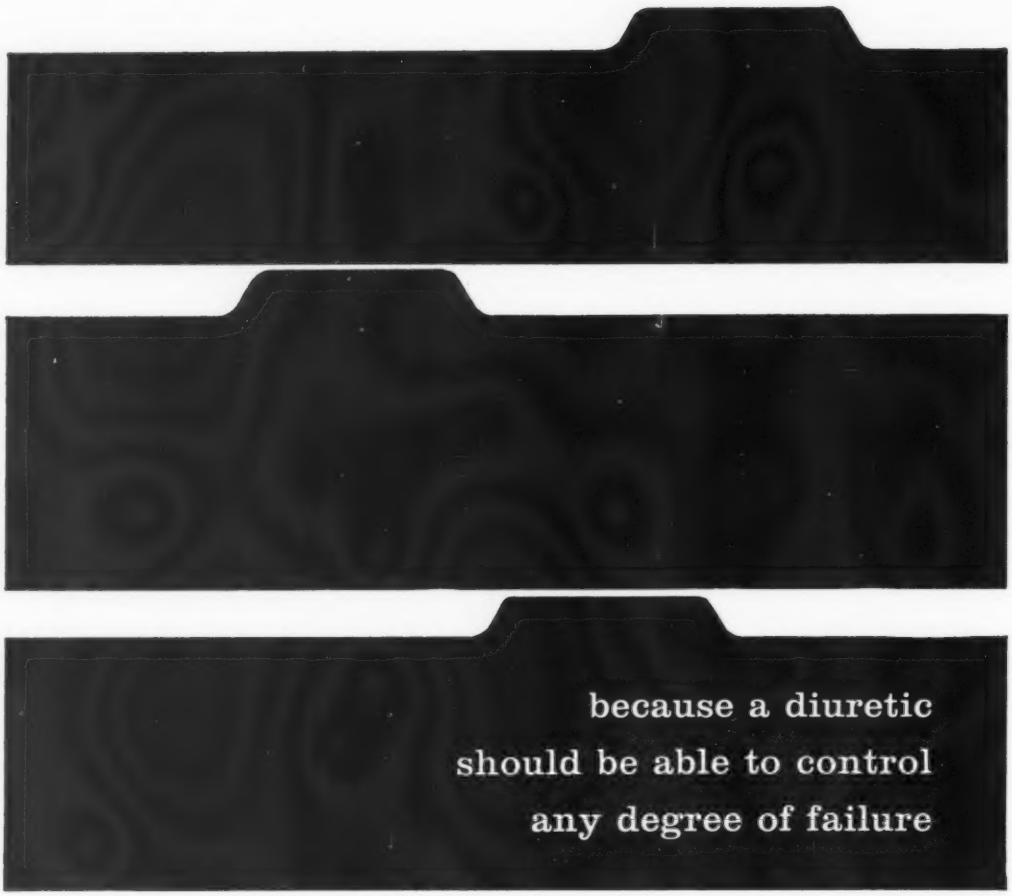
also TITRALAC Liquid—one teaspoonful (5 cc.) approximates two TITRALAC Tablets.

Two TITRALAC Tablets or one teaspoonful of TITRALAC Liquid provide a buffering action like that of ½ pint of milk.

TITRALAC

SCHENLEY LABORATORIES, INC • NEW YORK 1, N.Y. Schenlabs

TITRALAC IS SCHENLEY'S REGISTERED TRADEMARK FOR ITS BRAND OF AN ANTACID. 39650



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NEUROVASCULAR FACTORS in disease*

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NERVOUS TISSUE, like every tissue in the body, is supplied nutrients for energy, growth, or repair and is cleansed of metabolic products by the vascular system. However, the nervous system, unlike any other tissue, is unique in having different parts of the same cells (that is, axon, dendrites, and cell body) supplied by blood vessels which often originate from widely separated portions of the vascular tree. Impairment in the circulation to nervous tissue (hereafter referred to as a neurovascular disturbance) may, therefore, involve only part of a single cell or, in the general case, similar parts of several cells. The consequences of the functional alterations in which cell bodies are involved are often tragically obvious when embolism or thrombosis occurs in vital centers of the brain. The potential health hazard created by alterations in peripheral nerve or spinal cord vasculature, though less obvious, may be no less important to the well-being of the individual. This brief review of investigations indicates some of the functional and clinical manifestations that appear related to disturbances in the vascular supply to nervous tissue and examines their relationship to osteopathic principles.

Experimental manifestations of neurovascular disturbances in peripheral nerves

Almost everyone has experienced some of these manifestations when his foot or leg has "gone to sleep." This common phenomenon is generally the result of prolonged pressure transmitted through the tissues to the sciatic nerve; occasionally it may be due to stretching the nerve. In the human experiments to be described, pressure has been employed because it is easily produced and readily controlled.[1-6] The experimental results then reflect the reversible changes of the circulatory impairment that pressure produces as well as the direct mechanical effect of pressure on nerve fibers. These two pressure effects are difficult to separate, but in short-term experiments where they could be examined independently the same phenomena were produced by anoxia alone.[7]

The investigations to be reviewed reveal that circulatory impairment disturbs normal nervous function in three ways:

1. By disturbing the conduction in nerve trunks.
2. By causing alterations in non-nervous tissues which initiate nerve activity.
3. Through secondary reflex effects due to abnormal neural activity produced by processes 1 and 2.

Recognition of the physiologic mechanisms involved in these processes will help provide a basis for understanding many apparently diverse clinical problems.

The Ischemic State.—

When an arm cuff is inflated well above systolic pressure on a resting arm, there is first a gradual loss of the ability to appreciate touch, vibration, and pressure. Sensations of temperature are next lost, followed by loss of voluntary motor ability, and then of pain. These sensory and motor changes generally appear in the most distal portion first, later spreading centrally to the cuff level. None of these phenomena are especially disagreeable although, occasionally, abnormal sensations or paresthesias such as tingling or mild pricking sensations appear or may be provoked by stroking the hand or arm. These slight paresthesias, however, may be replaced by severe pain if the muscles in the arm are made active.[8] Pain thus produced will remain until the cuff is released and circulation re-established or until anesthesia is complete.

Objective electrophysiologic experiments have confirmed and demonstrated the altered nerve function related to the subjective findings.[9] Thus a marked slowing of conduction velocity was found in the sensory fibers passing under the cuff. The conduction velocity in motor nerves also decreased but later and less markedly. The changes in sensory conduction velocity

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indicate that rapidly conducting (large diameter) fibers cease functioning earliest, while slower fibers remain to convey only a portion of the sensory activity normally transmitted.

These observations, therefore, reveal that during the development of occlusive ischemia there is, first, a marked disorientation of information and activity directing channels of the nervous system and, ultimately, a complete loss of function.

The Postischemic State.—

When the occlusive cuff is removed after a period of 20 to 30 minutes a new series of subjective and objective events takes place. The returning sensations are typical paresthesias and may consist of extensive tingling, sharp prickling, and stinging lasting 30 seconds to a minute.[10] As these initial sensations are fading, a feeling of muscular tightness appears, which may be accompanied or followed by muscle contractions and involuntary movements of hand or fingers.

Electrophysiologic analysis has indicated that the first nerve fibers to recover are large-diameter, rapidly conducting, sensory fibers.[11] The next group to recover consists of the large-diameter motor nerve fibers. The peculiar sensations (paresthesias) are, therefore, in part the result of the abnormal situation created by having only the *faster* sensory fibers conducting information to the central nervous system. The impulses that do get transmitted along the fast sensory fibers apparently arise from chemical changes in the peripheral tissues which stimulate the sensory end-organs rather than the real event which normally produces the sensation. This was clearly demonstrated for the sensation of muscle tension by experiments in which, although muscle activity was prevented by d-tubocurarine injection, the feeling of tightness still appeared. Furthermore, the appearance of the muscle activity commonly observed was shown to depend on reflex excitement of motor fibers by the spontaneously generated activity in sensory fibers. This was demonstrated by noting the absence of muscle contraction when the nerve trunk was blocked by procaine injected above the cuff.

It is therefore apparent that impairment of circulation to tissues containing peripheral nerve trunks and sensory endings may have serious consequences. The loss of selected sensory paths provides the central nervous system with distorted information concerning the state of the tissues, while the spontaneous activity during recovery spuriously signals the occurrence of events that did not happen. The integration of reflex responses by the central nervous system thus has little basis in reality and may provide inadequate or even harmful autonomic or muscular responses. This discord may appear locally or systemically, depending on the particular nerve trunk affected.

Circulatory Arrest to Nerve Trunks Only.—

The preceding observations concerned circulatory arrest to all the tissues of the limb. Some of the observations are, therefore, related to metabolic products or changes in sensory endings and in non-nervous tissues. What happens when only nerve trunks are involved? This is readily examined in experiments on anesthetized animals by exposing and selectively eliminating neurovascular circulation. This procedure, however, permits only objective observation of impulses traveling in nerve fibers, or the response of muscles, without any clue to the sensations produced. In addition, some responses may have been abolished by the anesthetic agent. Within these limitations certain important manifestations are shown to be related to changes in the nerve trunks. For motor fibers it was found that shortly after producing nerve trunk ischemia the fibers were more excitable. The same strength of electrical stimulation applied to the nerve trunk produced a larger muscle response (that is, activated more motor nerve fibers) after circulatory arrest[12] than it did before. These heightened responses lasted for 10 to 26 minutes, at which time the nerves became inactive. After this prolonged period of circulatory arrest, full recovery occurred only after an hour or more. No spontaneous activity was observed during the postischemic state. If the circulation was restored before depression occurred, the entire cycle of circulatory arrest and hyperexcitability could be repeatedly reproduced.

Certain sensory aspects of acute circulatory arrest in nerve trunks have been studied in humans. In individuals having small, painless skin lesions on the hands, pressure applied to the radial nerve produced an initial mild tingling followed, after 14 minutes, by a smarting pain referred only to those skin lesions in the radial nerve distribution.[13] Following release from the pressure, no sensations from skin lesions or any other paresthetic sensations were observed. Muscular irritations responded similarly. When the first dorsal interosseous muscle was injected with 5 per cent saline and the immediate transient pain allowed to disappear, a pressure block to the ulnar nerve produced, within 5 minutes, a slight burning pain felt in the muscle at the site of injection. The increased perception of pain was also confirmed by the observation that within 10 minutes after pressure block to a nerve the pain threshold to a needle pressure stimulus was lowered.[14]

The heightened excitability of nerve fibers resulting from circulatory arrest apparently increases an originally unnoticeable flow of nerve impulses from the "painless" lesion to a larger flow that is perceivable as pain. The asphyxiated portion of nerve thus acts as an amplifier, converting normally weak signals into stronger ones. These stronger signals (that is, larger number of sensory impulses) may provide abnormal reflex or perceptive reactions.

These studies on asphyxia of small segments of a nerve trunk have revealed phenomena that differ from those occurring when an entire limb is occluded. These differences suggest that most of the paresthesias and other evidence of spontaneous neural activity in the postischemic state arise in the sensory organs and are probably related to accumulated metabolites.[10] Pressure on a portion of nerve does elicit mild transient tingling by direct stimulation of nerve fibers but mainly serves to exaggerate the impulses initiated by sensory organs. Either method of impairing neural circulation, however, gradually leads to a selective conduction loss in various fibers and finally a complete conduction block of both sensory and motor fibers.

Clinical Observations Related to Peripheral Neurovascular Disturbances.—

The short-term experiments that can be terminated abruptly at the wish of the investigator or his subject can only suggest the type of neural disturbance that may occur during chronic or intermittent periods of circulatory impairment in nerves. The clinical cases to be described reveal the modifications that accrue with time, secondary tissue changes, and various admixtures of circulatory impairment in nerve trunks and other tissues.[15-17]

The *ulnar nerve* at the elbow may be subject to pressure or tension due to the development of cubitus valgus following fractures. In these cases paresthesias with tingling and prickling are observed early in the

course with subsequent muscular weakness developing in untreated cases. The *median nerve* may be subjected to pressure where it passes through the carpal tunnel because of stenosis of the tunnel or swelling on a flexor tendon. When this occurs it may produce analgesia and impaired movement (muscle weakness) in the median distribution. The *brachial plexus* in some individuals is subjected to tension where it passes over the first rib. This produces discomfort and tingling when heavy weights are carried. Even when little or no discomfort has been noted through the day, these individuals often wake at night with such severe tingling and prickling that it approaches a pain sensation. These symptoms are apparently related to the "release phenomena" noted in the occlusive cuff experiments and signify the phase of recovery from sustained circulatory impairment. The *lateral cutaneous nerve* may be pressed at its point of emergence through the fascia femoris, giving rise to tingling and prickling and occasionally numbness in the outer half of the thigh. The *peroneal nerve* may be affected by pressure from the head of the fibula. Pain may be felt along the outer leg and foot. In long-continued cases there may be muscle weakness and foot drop, in which event tingling and prickling are seldom major symptoms. In long-standing cases of rheumatoid arthritis tingling and prickling often occur with vasodilatation and other trophic changes around the affected joints. Such cases are apparently related to pressure from inflammatory nodules that are found in the perineural sheath of the affected nerve.[18]

In a case described by de Takats[16] the *median nerve* was injured by a Colles' fracture. The hand and finger area supplied by the median nerve was hot, dry, and painful, displaying the characteristics of causalgia. At operation the median nerve was found thickened and hyperemic with an organized hematoma at the proximal edge of the carpal ligament.

In acute metatarsalgia (Morton's toe), pain is a characteristic finding. While the individual is walking, a sudden, severe pain begins on the outer border of the foot and subsides with rest. In early cases, tingling of the fourth toe when the patient is standing on tiptoe or numbness of the fourth toe after standing may be noticed. Vasodilatation frequently appears in the toes during the acute attack of pain. This condition results from pinching of the digital nerve between the fourth and fifth metatarsal bones. In old cases of this disorder, there is a demonstrable fusiform swelling of the nerve, containing fibrous bodies that appear to be remnants of degenerated intraneural blood vessels.[19]

Skillern[17] has observed several cases of irritation of the *suprascapular* nerve at the point where it passes through the suprascapular foramen. An analysis of fifty cases indicated that the majority have pain from the acromion down the extensor side of the arm and muscle spasm with limitation of shoulder motion. The pain and muscle spasm may be provoked or exaggerated by certain arm movements that stretch the suprascapular nerve. Tingling and prickling in the fingers and numbness and coldness were observed in 10 per cent of cases. Over 80 per cent had localized painful "wincing" spots in the infraspinatus and supraspinatus muscles. These cases apparently result from circulatory changes in the nerves due to a constant "string-sawing" irritation where they pass through the suprascapular foramen.

In all of these cases described above, the symptoms of tingling and prickling are paroxysmal in nature and may be provoked by movement or pressure of a certain type. In the early stages the numbness and weakness may also be transient, but in older untreated cases they gradually become permanent. These examples illustrate the essential similarity between acute experimental and chronic peripheral neurovascular disturbances in the production of tingling, prickling, numbness, and muscle weakness. New features that emerge in the chronic cases are pain and sustained autonomic and trophic changes.

The presence of pain in some of these chronic cases indicates involvement of tissues or processes that are not generally influenced by the experimental procedures. Experimentally, in the acute cases, transient pain was observed only in those with injured tissues or in active ischemic muscles, not in the normal tissues. The pain in these chronic cases appears to stem from at least three major sources:

1. Weak signals arising in abnormal muscle, joint, tendon, or skin being amplified into noticeable pain by an asphyxiated portion of nerve similar to the phenomenon noted in the experimental results.

2. Irritation of the epineural sheath by the same process that is disturbing circulation to the nerve fibers within the sheath.

3. Tissue alterations resulting from disturbances in autonomic function or other trophic changes.

It is this last type of mechanism which may become a key factor in promoting a cyclic vicious circle type of reaction. The trophic alterations in the tissues may promote reflex autonomic and somatic reactions, aggravating and sustaining the neurovascular disturbance, thus furthering the trophic alterations. Steinbrocker, Spitzer, and Friedman[20] have hypothesized that such a mechanism may be a basic process in a variety of syndromes having different initial etiologies but exhibiting common clinical features. These conditions include causalgia,[16,21] palmar and digital contractures (including Dupuytren's contracture),[22] the swollen atrophic hand of cervical osteoarthritis,[23] painful disability of the shoulder following coronary occlusion,[24] Sudeck's atrophy (post-traumatic osteoporosis),[16] trophic ulcers of the hand following myocardial infarction,[25] the shoulder-hand syndrome following hemiplegia,[26,27] and the idiopathic shoulder-hand syndrome.[20] In addition to these well-defined syndromes involving the arm and shoulder, Steinbrocker, Spitzer, and Friedman[20] indicate that similar disturbances may occur elsewhere in the body (for example, trunk and lower limbs). The common characteristic features in all of these conditions are various degrees of pain, muscular abnormalities, and vasomotor and trophic changes that are often relieved or restored to normal following blockade or surgical interruption of sympathetic pathways.

Syndromes characterized by these common features have been referred to as reflex dystrophy or reflex sympathetic dystrophy. The hypothesis is suggested that the basic mechanism is a disturbance of circulation to nerve tissue through trauma, reflex vasospasm, or possibly embolic or thrombotic formation.[28] These neurovascular disturbances are then followed by the development of various trophic and secondary reflex changes. The vicious circle nature of the phenomenon is well illustrated by the permanent recovery that sometimes follows a single block of appropriate sympathetic ganglia.

This hypothesis, although originating from clinical observations, receives substantial support by several experimental studies indicating that neurovascular disturbances are often produced by the same circum-

stances that initiate reflex dystrophy. In investigations on referred pain of cardiac origin, the production of myocardial ischemia in experimental animals was followed by a reflex constriction of blood vessels supplying the brachial plexus. It was concluded that such neurovascular reactions provided the basis for the reference phenomena of cardiac origin.[29,30] The frequency with which reflex dystrophy follows trauma or tension[31] affecting nerves may be related to evidence obtained by direct observation on nerve circulation in animals. In such experiments Murdock[32] noted that any sort of stretching or pinching of the nerve caused the blood flow to stop. This was frequently followed by thrombosis and hemorrhage of the neural vessels. Another group of investigators[33] studied the effects of artificial lengthening of the femur in animals and concluded that "arterial spasm may be expected in any injury resulting in stretch of the arterial system." They also found that after an over-riding fracture that permitted shortening for a considerable period, arterial spasm may occur when a return to normal length is made. Stretch or tension of the suture line in nerve repairs is also notorious for its ill effect on the regeneration process. This may be related to a spasm of existing circulation and possible inhibitory effects on regenerating blood vessels.

From this brief review of a constantly growing body of experimental and clinical observations it appears that disturbances in the circulation to peripheral nerves may be a common basic mechanism producing a wide variety of syndromes. The signs and symptoms are in general a reflection of the lost, exaggerated, or false information conveyed by asphyxiated sensory fibers. To this is added further distortion by asphyxiated motor fibers of the reflex responses organized by the central nervous system on the basis of the disoriented sensory information it received.

The common basis of neurovascular disturbance is recognized by the characteristic presence in each syndrome of various degrees of the following manifestations:

1. Sensory disturbances manifest by paresthesias consisting of paroxysmal tingling and prickling.
2. Early transient numbness with late development of permanent analgesia.
3. Early transient muscular hyperactivity or spasm with late development of muscular weakness and atrophy.
4. Autonomic and trophic alterations.
5. Pain.

For reasons not yet clear, any particular syndrome may present only some of these manifestations. Some of the reasons for variation in these manifestations are undoubtedly related to the particular nerve involved, the portion of the nerve affected, hereditary factors, past history, nutritional status, and the primary or secondary involvement of non-nervous tissues. To these may also be added the possibility of accompanying vascular changes within the central nervous system. This last factor may be especially important since circulatory alterations there affect the organizing and coordinating function of the nervous system. In the next section are presented some observations on this type of neurovascular disturbance that are significantly related to musculoskeletal abnormalities or irritations.

Vascular alterations involving cell bodies

Important as they are, the vast number of observations on gross cerebrovascular accidents are not included in this discussion. The material to be reviewed here represents some of the relatively few studies related to circulatory disturbances in the spinal cord and its immediate extensions—the dorsal root ganglia. These particular studies were chosen because they reflect the importance of the musculoskeletal system.

Dorsal Root Ganglia.—

Each dorsal root ganglion is an enlargement of the posterior nerve root that contains the cell bodies of sensory fibers carrying impulses toward the spinal cord. It generally lies just within the intervertebral foramen. Tension or pressure may be applied to these structures by abnormal stretch of the nerve root, the force of a herniated intervertebral disk, or abnormalities or injuries of the vertebrae.[34] The occurrence of these mechanical events could readily affect the blood supply to the spinal ganglia. In fact, Bergmann and Alexander[35] observed that

> Most of the vessels supplying the spinal ganglion originate from the main vascular trunk (the spinal arterial branch) at right angles or by way of recurving arcs, arising off and frequently against the direction of the blood flow in the mother branch. This explains the fact that higher pressure and a longer time are needed to inject the arteries of the spinal ganglion than the spinal and radicular ramifications of the same segmental vessel.

These same investigators then concluded:

> If analogy drawn from other, better known parts of the nervous system is permissible, the arterial supply of the spinal ganglia may be considered to be rather vulnerable.

The frequency of involvement of dorsal root ganglia in neurovascular syndromes remains to be determined. That it may be high is suggested by the numerous reports of a decrease in the number of spinal sensory neurons with advancing age.[36-40]

Spinal Cord.—

Although detailed descriptions of the anatomic features of spinal circulation have been given,[41,42] the functional control of these vessels still remains to be clearly identified. In general it appears that sympathetic or other autonomic control is relatively weak, with stronger control exerted by local changes in the interstitial environment of the vessels. Since local changes in the interstitial fluid are generally a result of local cellular activity, such a system effectively regulates the blood supply in accordance with local requirements. The weaker sympathetic control thus makes the central nervous system relatively independent of regional or systemic vascular adjustments. However, there is considerable evidence that the functional integrity of cord vessels is not completely immune to adverse peripheral or musculoskeletal injury or disturbance.

For some time data have been accumulating which indicate the localizing influence of muscular activity, trauma, vaccination, tonsillectomy, and pregnancy on the incidence and site of poliomyelitis involvement. In an inquiry into the mechanisms that might account for these observations, Trueta[43] has obtained experimental evidence in animals that irritating injections into muscles, but not into skin, produced hyperemia of related regions of the spinal cord. The mechanisms responsible for the vascular changes have not been identified but may be related to a sustained increase in cellular activity by activated neurons. The significance of muscle irritation remains to be clarified, but is worth noting as another confirmation of the unique character of muscular involvement.

Similar localizing tendencies were observed by Bodian[44] in monkeys inoculated intravenously with

poliomyelitis virus. Intramuscular injections of vaccines, penicillin, cortisone, and even isotonic saline promoted localization of poliomyelitis in the injected muscles. The poliomyelitis virus apparently passed more easily through the spinal vessels. Although Bodian was unable to confirm the presence of hyperemia as reported by Trueta, he concluded at that time "that the mechanism of the 'provoking' effect of injections or of trauma is to produce a reflex change in vascular penetrability in the vessels of the corresponding part of the spinal cord."

The presence of focal hyperemia within the spinal cord, however, has been noted by several other investigators and is apparently not uncommon. Widely disseminated areas of focal hyperemia and thrombosis were observed by Scheinker[45] in several accident cases involving considerable musculoskeletal trauma. Similar observations have been made independently by Burns,[46] McConnell,[47] and Cole,[48] each of whom reported focal hyperemia and congestion in spinal cord areas related to manually produced musculoskeletal irritations.

These observations, though hardly conclusive, strongly suggest that musculoskeletal irritation of traumatic or chemical origin may seriously disturb spinal cord circulation and possibly alter the barrier between blood and the neural interstitial fluid.[49-52] The implication of such disturbances is based on an appreciation of the delicate chemical equilibrium required to maintain normal neuronal activity. Disturbances in this equilibrium may render groups of cells under-responsive (inhibited) or over-responsive (facilitated), thereby destroying the smooth, coordinated nervous function that contributes to the maintenance of health.

Relationship of neurovascular disturbances to osteopathic principles

The material reviewed in the previous section reflects an increasing recognition and understanding of certain potentially detrimental neurovascular mechanisms which may influence, or be influenced by, the musculoskeletal system. The osteopathic profession has, through the years accumulated empirical evidence indicating the importance of the somatic (musculoskeletal) component in disease. An inquiry into the relationship between these different experiences would appear to be of considerable practical and theoretical importance.

During the past few years a number of observations have been made at the Kirksville College of Osteopathy and Surgery concerning the somatic component of disease and somatic-autonomic interchange. Some of the most recent observations have been presented by Wright,[53] and others have appeared earlier. Briefly these findings include the following:

1. Muscular hyperactivity (low reflex thresholds): Quantitative differences in the ability to provoke paraspinal reflex muscular activity in response to pressure stimuli have been observed.[54,55]

2. Trophic changes in low reflex threshold areas: The pressure stimuli applied to hyper-responsive spinal areas often caused bruises, even at low pressures, although bruises seldom appeared in normally responsive areas even with much higher pressures. An abnormal texture of the paraspinal tissues was also noted in the hyperirritable segments.[55]

3. Autonomic disturbances: A number of investigations have revealed and quantitated altered sweat gland[56,57] and vasomotor activity[58,59] in localized cutaneous areas. In some instances this altered sympathetic activity was found to be related to muscular hyperactivity.[60-62]

4. Pain: Although most of the observations in these studies were made on apparently healthy young men, the occurrence of acute or chronic pain in paraspinal areas was often correlated with muscular and autonomic alterations. Preliminary experiments have indicated that even in the absence of spontaneous pain there is a lowering of the pain threshold in areas having autonomic and muscular alterations.[61]

The similarity between these quantitative findings and the general manifestations of neurovascular disturbances listed earlier in this article is quite striking. Even more impressive are the many successful empirical therapeutic procedures utilized by osteopathic physicians. A large majority of these procedures are directed toward the reduction of abnormal or asymmetric tension or pressure in tissues, two conditions that are recognized contributors to neurovascular disturbances.

These observations suggest the possibility that the array of manifestations identified by the osteopathic profession as the osteopathic lesion complex may have the same basic mechanism as the various neurovascular syndromes. They may even be the same process with different identification tags. Such duplication of names is probably inevitable since the designation "osteopathic lesion" or "osteopathic lesion complex" does not symbolize a single, discrete entity but is a generic referent for a constellation of phenomena of special importance to the osteopathic profession. A quotation from McBain[63] makes this clear:

> They [osteopathic technics] develop from the recognition of somatic structural abnormalities and their effect upon visceral function through the integration of the nervous system. Because these structural perversions are either not recognized or are considered of slight importance by other schools of practice, they have become known as osteopathic lesions.

The ignorance and indifference of other schools of practice implied by this statement can hardly be expected to continue. It is already beginning to disappear as more and more scientific inquiries are made concerning many biologic phenomena involving somatic-autonomic interchange such as trigger points,[64] referred pain,[65] and myodysneuria,[66] as well as the neurovascular syndromes considered in this article. It is also apparent that any of these phenomena may properly be identified as constituting osteopathic lesions or osteopathic lesion complexes.

When thus recognized, the growing number of inquiries in this field enriches and reflects the basic validity of the osteopathic concept. This new biologic knowledge contributes to osteopathic principles and practice by helping reveal the basis for the success of an advanced therapeutic concept that was evolved in an era of relative ignorance concerning biologic mechanisms. The full potential of the osteopathic concept will not be realized unless there is a continuous and willing appraisal of these past and current successes in the light of the rapidly expanding knowledge of the present, and unless the osteopathic profession makes its own special contribution to the further understanding of these mechanisms.

Summary

This article has reviewed some of the contributions toward understanding bodily function as influenced by disturbances in the circulation of the nervous tissue. Neurovascular disturbances represent a potential health hazard by their capacity to produce disorganization of

the information (sensory), directive (motor), and coordinative (central nervous system) activity of the nervous system. The resulting reflex, autonomic, and trophic changes, by adversely affecting organ or systemic homeostasis, decrease vital reserves and impair the individual's ability to withstand life's daily stresses. Because neurovascular disturbances may frequently result from, or be influenced by, musculoskeletal abnormalities, they are of particular significance to the osteopathic physician. In fact, the similarity between the general manifestations of the neurovascular syndromes and the phenomena related to the osteopathic lesion suggests that they may share the same basic mechanism. They are, possibly, the same process with different labels, an important inference which can only be clarified by further investigations.

Regardless of their origin or labels, the recognition that musculoskeletal abnormalities may initiate, aggravate, or sustain neurovascular disturbances is further confirmation that a therapeutic concept emphasizing somatic factors in disease is a distinct contribution to the healing arts.

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WARTS:

Discussion, with special reference to therapy by total enucleation

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WARTS HAVE LONG BEEN relegated to the category of a rather ubiquitous nuisance by the physician in general practice and have long disturbed the dermatologist. The cause of warts has been assumed to be a virus, yet fairly recently an article[1] has appeared showing that the virus has not been grown in more than one questionable case. In fact, there is much doubt that it has been visualized by an electron microscope.[2]

In practice, a seemingly endless procession of warts of all sizes, shapes, and kinds is seen, most of which have had some previous treatment. Therapy has fluctuated with reports in the literature, and physicians have often been at a loss to give any therapy.

Evidence that this confusion concerning therapy for warts is widespread was found in reviewing the literature, for we found no less than thirteen therapeutic procedures described in the *Archives of Dermatology and Syphilology* over the past 12 years. Recommended treatment included use of: vaccine of wart suspension,[3] podophyllin resin,[4-6] liquid phenol followed by nitric acid,[7] topical monochloracetic acid with salicylic acid paste,[8] contact roentgen therapy,[9,10] electrosurgical loop removal,[11] formaldehyde,[12] oral bismuth,[13] curettage,[14] and psychotherapy.[15] Elsewhere application of procaine under the lesion,[16] euphorbium resin,[17] and liquid nitrogen[18] have been suggested.

In a recent forum discussion by nine dermatologists,[19] most of the above were suggested, along with radium, sclerosing with bismuth, electrodesiccation, and unfiltered x-ray therapy with great variation in range. Recent dermatology texts,[20-22] in addition to the above, discuss the use of grenz ray therapy, solid carbon dioxide, and variations of the many procedures previously mentioned.

The most consistent finding in cases of warts is their variability. While the age of greatest frequency is from 10 to 20 years, they have been reported to be present before birth,[23] and they are found occasionally in the aged. They are reported to occur more frequently in females.[24] In 100 consecutive cases, we found 46 were in females and 54 were in males. The average age was 22.76 years, the oldest 67, and the youngest 3.

The lesions begin their development at the basement membrane and, particularly in plantar warts, early lesions demonstrate themselves by a vesicle-like appearance, actually vesicle-like only because there is a translucent area under the skin, but the papillary lines of the sole or palm remain intact. This can only be explained by the response of the host plus the presence of the virus in some minute trauma.

Why a wart should have a relative limitation of size has not been satisfactorily explained. Perhaps this is related to blood supply, and there may be some association to capillary response by the virus. This is somewhat confirmed by the finding of a direct relation of capillary loops to size of the verruca, these loops apparently projecting through the basement membrane. That the blood supply is a major factor in wart growth is suggested by results in two methods of therapy: (1) X-ray therapy affects the capillary structures of a wart rather than the less sensitive epithelial cells, and (2) sclerosing solutions effect cures with some regularity.[16] Certainly the blood supply of a wart is out of proportion to that usually found in skin lesions other than vascular tumors.

Because of the apparent increase in the incidence of verrucae and the confusion of treatment, we became interested in obtaining further information about the character of the mass and its relation to tissue. A double-ended steel ear curet, one end measuring 2 mm. in width and the other 3 mm., was obtained. It was found that use of this curet offered not only a means to better study but also an excellent method of therapy.

In raised verruca vulgaris of the fingers, face, and other parts of the body, simple pressure causes separation. This pressure is made toward the center of the mass and establishes a line of cleavage that is one to two cells in depth. Once a line of separation begins to form, pressure in this line will allow shelling or total enucleation. This method of therapy is certainly not totally original, for every physician has had patients tell him that they had a wart they "picked off." In the bearded areas, small lesions may be removed without anesthesia, particularly when the lesions are multiple. Larger verrucae are blocked with local anesthetic. Scarring is practically absent, and the incidence of recurrence is less than when the cautery is used. Since cauterization cannot be limited in depth to the thickness of 2 to 3 cells, scarring is much greater. The inflammatory reaction of the burn seems to increase the incidence of recurrence.

In verruca plana juvenilis, the simple curet will clear the lesions, and it is only rarely that the child requires an anesthetic. Chilling the area is a help but is not always necessary. It would be expected that Koebner's phenomenon would follow such a procedure inasmuch as this frequently occurs in verruca plana, yet during the 2 years we have used this method, Koebner's phenomenon has not occurred.

In verruca plantaris, shelling is superior to other forms of therapy. It is often expedient to remove the keratin by means of clippers. The area is blocked with plain 2 per cent procaine. Plain procaine is used in order to avoid possible vasospasm and gangrene of the fingers or toes. The shelling proceeds with pressure from the edge toward the center of the lesion. The

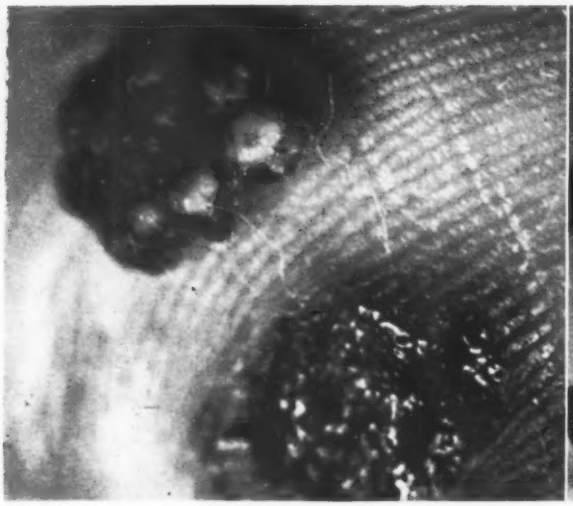


Fig. 1

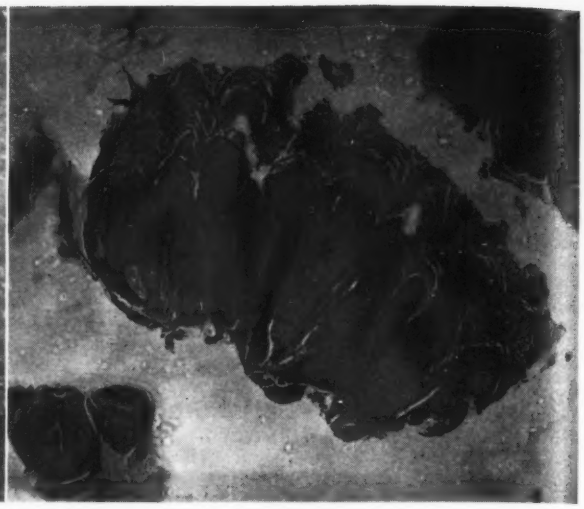


Fig. 2

Fig. 1. Entire shelled verruca and skin defect. Note bulbous base produced by molded tips of rete "pegs" and shallowness of wound. The wart as shown is inverted so that the contacting surface can be seen. Fig. 2. Histologic section of entire shelled verruca. Note typical hypertrophy of epidermis, hyperkeratosis, and central pointing of rete "pegs." Separation has occurred at the cutoepithelial border except for the papillae intimately associated with the thickened epidermis (30X).

basal portion of the verrucose mass, being bulbous and varying in depth, is readily followed and easier to separate than the edges. Since the curet is not sharp, its effect is that of a slightly dull wedge. A sharp curet cuts into the mass or penetrates subcutaneously.

One complication of shelling in plantar and ungual warts is bleeding, which is profuse and may be delayed. Immediate pressure, packing of a gelatin sponge or gelatin powder into the wound, and application of a pressure bandage will control the bleeding. A rubber band tourniquet is used on digits, and a pressure dressing is placed before its removal.

Ungual warts have been found to shell even though the lesions are subungual and the amount of apparent destruction leads to little or no apparent scarring. The depth and penetration of ungual warts can best be understood from this shelling procedure. In this type of wart, bleeding is even more of a complicating factor. Again plain 2 per cent procaine and a rubber band tourniquet are used. After the lesion is removed, a gelatin sponge is placed in the defect, and the finger or toe is completely bound with reinforced layers of tape before the band is cut. The bandage is not removed for 24 hours, and in some cases it is necessary to reapply a pressure bandage.

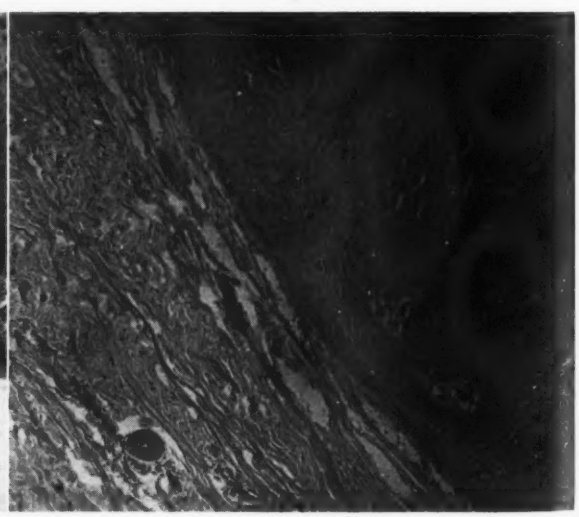
In shelling of verrucae it is important that any overhanging tissue be trimmed with fine clippers such as cuticle clippers. Failure to pay close attention to this detail may result in recurrence.

The incubation period of warts is extremely variable, possibly extending up to 7 months. In one case, a 43-year-old mother developed a plantar wart 7 months after one had been removed from her son. There was no history of other exposure. Following re-

Fig. 3. Base of shelled verruca. Note line of cleavage generally at cutoepithelial border. Note also the dilated capillaries in the papillae (200X). Fig. 4. Verruca in situ. Note looseness of corium at base of verruca allowing shelling by this method (200X).

Fig. 3

Fig. 4



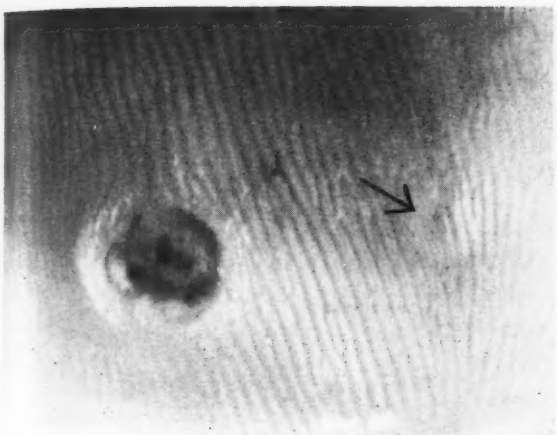


Fig. 5. Verruca plantaris with incipient lesion (indicated by arrow) showing vesicle-like appearance with papillary lines intact. No clinical evidence of previous trauma.

moval of warts, some of our patients have frequently developed lesions at new locations. We have examined a patient who at the end of 2 months had no evidence of warts but at 4 months had new lesions. At least one woman with ungual warts developed new lesions on the index finger, but on the opposite side, 16 months after shelling. The previously shelled site remained free of verrucae. In occasional instances of immediate recurrence (within weeks) there has been failure to remove the verrucose tissue completely.

Dilute podophyllin resin in alcohol has been used in a few cases following shelling. However, it is not necessary, as the incidence of recurrence without its use has been less than 3 per cent. We do not suggest podophyllin as a routine procedure after shelling.

It appears to us that an infectious organism, probably a capricious virus, may remain saprophytic until such time as a minor injury triggers a body reaction, much in the way the herpes simplex virus is present but clinically dormant until an excitant precipitates a reaction.

The trauma incident to the development of verrucae must be extremely variable. It has been our custom to wipe the area with isopropyl alcohol before administering the anesthetic, at the same time reducing bacteria at the site of the verruca. No gloves are worn. In the process of treating more than 1,000 warts one of us developed a verruca on an index finger. The lesion began insidiously and was shelled approximately 3 weeks from the time of its onset. Until the lesion was shelled it was recognizable only as a change beneath papillary lines and not as verruca. Verruca was, however, suspected. Because of their use for pressure, operators' fingers receive repeated slight trauma and are in contact with implements potentially highly laden with virus (?). We have not considered further protection against possible exposure to be necessary. If verrucae are consistently infectious, the very technic of shelling should cause extensions of the process. Only simple mercurial antiseptics are used following shelling, and infection has not been a complication.

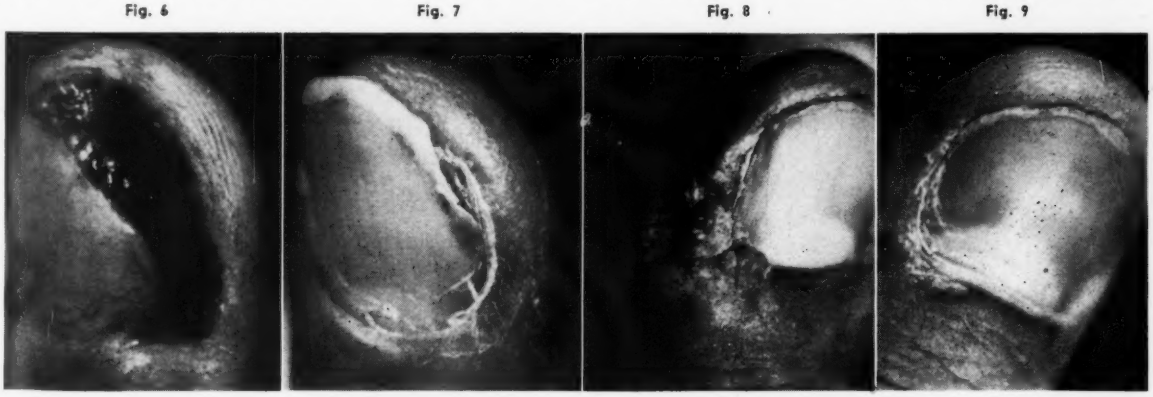
One incident which supports the theory of the presence of an unknown virus occurred in relation to a case of verruca acuminata in a 13-year-old girl. A wart measuring 10 cm. was located around the rectum and extended above the pectinate line. The patient was first seen in November 1955. By March 1956 she was discharged with no evidence of verruca. In April, she bathed with her 15-month-old nephew, and in July the infant had verruca acuminata of the rectum. There was no evidence of recurrence in the girl.

One other advantage of shelling over other therapy has been demonstrated in two patients where foreign bodies were associated with plantar warts. In one case, the probability of a foreign body (metal) was suspected because of pain radiating to the dorsum of the foot. In the second, the presence of a foreign body (glass) was not suspected. It would have been a gross injustice to have used x-ray or destructive cautery on these two patients, for it is doubtful that either foreign body would have been removed.

A word of caution must be given concerning the limitations of this procedure. Most important to the procedure is correct diagnosis. Clavi must not be mistaken for warts. Arsenical keratosis, which we have seen on rare occasions misdiagnosed as verrucae, would, of course, not be receptive to this therapy. We have also seen neurovascular lesions, such as those which often precede malum perforans, diagnosed as plantar warts. There are some callous tissues, often in scars from destructive procedures of previously treated warts, that have capillary loops in them. These, of course, must not be treated by shelling. Occasionally, rare diseases such as epidermodysplasia verruciformis and the verruciform type of tuberculosis might be mistaken for warts. Ideally, the lesion for shelling is one circumscribed so sharply that a cleavage line may be demonstrated.

Fig. 6. Appearance immediately after shelling of ungual verruca. This degree of subungual growth is not unusual. Nine fingers of patient were involved with ungual verrucae. Fig. 7. Appearance 3 weeks after shelling. Fig. 8. Paraungual verruca before shelling. Fig. 9. Appearance 6 weeks later.

Fig. 6 Fig. 7 Fig. 8 Fig. 9



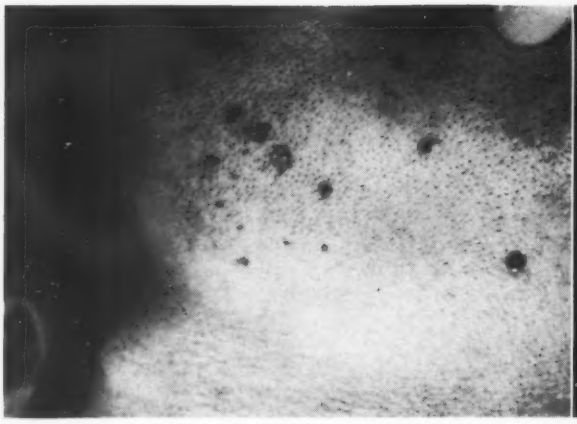
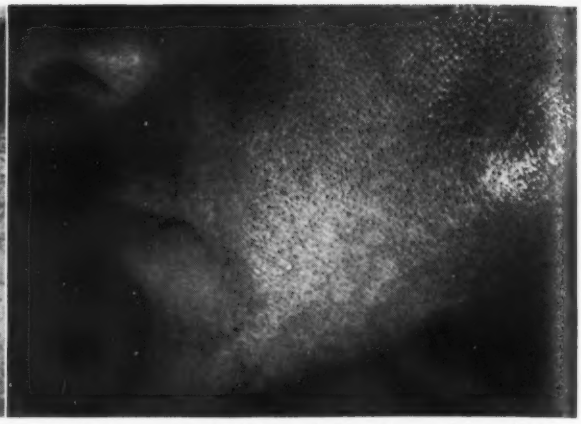


Fig. 10. Appearance immediately after shelling bearded area.



11. Appearance 2 weeks following shelling. Scarring is not evident.

Postoperative discomfort of shelling is in direct proportion to the size and the number of lesions removed at one time. It is not comparable to the discomfort following cautery, being generally much less, or to procedures such as treatment with salicylic acid paste.

Scarring may not occur following removal by shelling, and in most cases the form of papillary lines is relatively the same as it was previously. However, because the basement membrane is removed, slight evidence of the procedure may remain, although it is not as great as that seen following cauterization or other destructive methods.

Conclusions

1. Verrucae may be removed successfully by the relatively simple procedure of shelling with a 3-mm. dull curet.

2. In our hands the incidence of recurrence has been less than with other procedures.

3. The basal surface of verrucae is as bulbous as the exposed surface; therefore, shelling is less destructive, painful, and traumatic than are other procedures.

Acknowledgment

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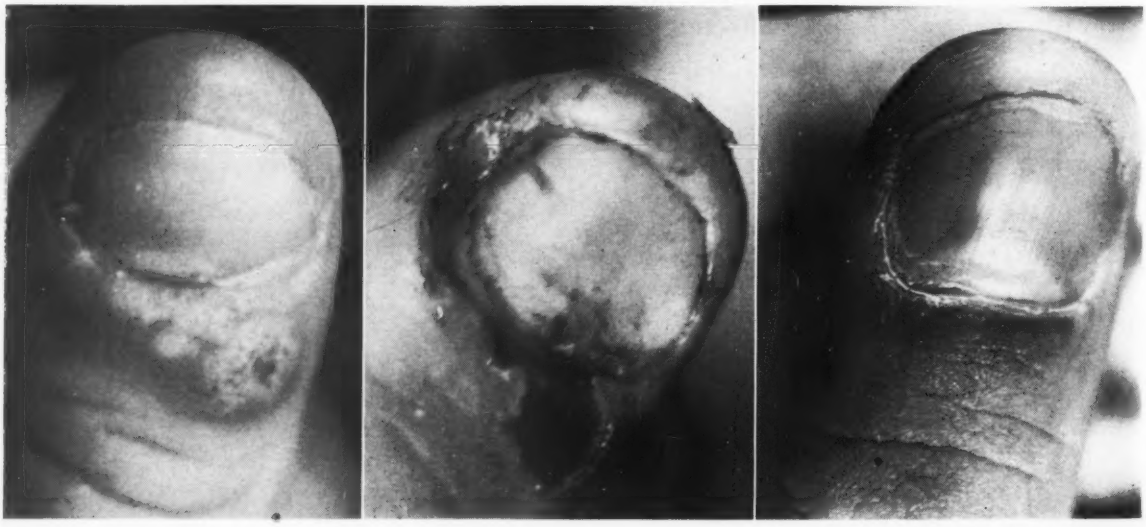
Fig. 12. Verruca vulgaris before treatment.

Fig. 13. Appearance immediately after shelling.

Fig. 14. Appearance 3 weeks after shelling.



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A study of 235 cases of

MYOCARDIAL INFARCTION

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THE PURPOSE OF THIS paper is to compare a series of cases of proved myocardial infarction with similar studies by other investigators. This is a means of determining the degree of success in the therapy of myocardial infarction. As few previous studies of this nature have been performed in osteopathic hospitals, it is timely to add this series to the mounting evidence of the efficacy of anticoagulants in the therapy of myocardial infarction.

The findings in this series and some of the current problems in the management of patients with acute myocardial infarction are briefly discussed.

Selection of cases

Detroit Osteopathic Hospital records were reviewed originally to accumulate the experience from 200 consecutive cases of myocardial infarction meeting standard criteria. These criteria were: (1) proof of acute myocardial infarction by autopsy, or (2) classical serial electrocardiographic change, that is, Q waves greater than 0.03 second from onset to nadir and greater than 25 per cent of the amplitude of R in depth; elevation of the S-T segment with progressive deepening and inversion of the T waves over a period of 3 weeks or more.

The study included 200 cases meeting the above criteria which were collected from mid-August 1953 until July 1955.

After the data from these cases were reviewed, it was noted that the number of patients not receiving anticoagulant therapy was small. Therefore, a review was made of all cases meeting the above criteria in the institution from January 1, 1950, to December 31, 1950, and 35 additional cases were thereby included.

As therapy in 1950 differed in only one minor respect (use of khellin in 1950 as compared with Peritrate in 1953 to 1955) and in one major respect (use of norepinephrine in shock in 1953 to 1955), it was decided to add this small series of 35 cases to the larger series, thus giving a total of 235 cases in the review.

General characteristics of series

Comparison is made of the age and sex distribution of the cases in the Detroit series, in those collected by the Committee on Anticoagulants of the American Heart Association,[1] and in those of Mintz and Katz.[2] Also included in the comparison of ages is the series of Master, Dack, and Jaffe.[3] (Tables I and II.)

TABLE II—AVERAGE AGE OF PATIENTS WITH MYOCARDIAL INFARCTION

	No. of cases	Males	Females
Detroit series	235	56.9 yrs.	65.5 yrs.
Committee on Anticoagulants[1]	1031	57.9	63.9
Mintz and Katz[2]	572	58.4	62.4
Master, Dack, and Jaffe[3]	500	54.7	56.0

TABLE I—AGE DISTRIBUTION OF PATIENTS TREATED WITH ANTICOAGULANTS FOR MYOCARDIAL INFARCTION

	Committee on Anticoagulants[1] (1,031)			Mintz and Katz[2] (572)			Detroit series (235)		
Age group	% Both	% Male	% Female	% Both	% Male	% Female	% Both	% Male	% Female
20 - 29	0.1	0.1							
30 - 39	2.4	3.1	0.4	3.8			3.5	3.7	2.5
40 - 49	16.1	18.4	8.7	15.9			15.0	16.0	7.6
50 - 59	35.9	39.7	23.6	32.7			27.5	31.8	12.8
60 - 69	29.6	26.1	40.9	33.6			36.0	34.6	41.0
70 - 79	13.8	11.4	21.5	12.8			15.5	13.3	26.0
80 - 89	1.8	1.1	4.1	1.2			2.0	0.6	7.6

*At the time this paper was written, Dr. Briner was Senior Resident in Medicine and trainee, National Heart Institute Cardiovascular Training Grant Program, Detroit Osteopathic Hospital.

The location of infarctions as diagnosed by electrocardiographic methods in several series is compared in Table III.

TABLE III—SITES OF MYOCARDIAL INFARCTION

	% Anterior	% Posterior	% Lateral
Detroit series	51.0	47.0	2.0
Committee on Anticoagulants[1]	53.0	37.1	0
Mintz and Katz[2]	55.0	35.8	0.4
Willius[4]	44.8	35.4	0
Doscher and Poindexter[5]	53.9	36.5	0

Incidence of arrhythmias

It is generally appreciated that the occurrence of certain types of arrhythmias materially increases the seriousness of the prognosis. By excluding premature systole, sinus tachycardia, and intraventricular block, 37 arrhythmias, an incidence of 15.7 per cent, was determined. Of these, atrial fibrillation was found in 51 per cent, atrioventricular block in 18 per cent, and supraventricular tachycardia in 13 per cent. Two cases of ventricular tachycardia were found in the group. Finally, the incidence of arrhythmias was 35 per cent in the group of patients who died and 9.8 per cent in the patients who lived.

Mintz and Katz[2] found the incidence of arrhythmias (except those excluded above) to be approximately 15 per cent in all cases of acute myocardial infarction in their series and an over-all incidence of 9 to 27 per cent with an average of 18 per cent in their review of the literature. The same authors concluded that the most common arrhythmias in myocardial infarction are first degree atrioventricular block, atrial fibrillation, second degree atrioventricular block, and paroxysmal tachycardia.

Pearson[6] demonstrated a total incidence of arrhythmias of 25 per cent, again excluding premature systoles and intraventricular block.

Incidence of diabetes mellitus

Fifteen cases of diabetes were found in the Detroit series, representing an incidence of 6.5 per cent. Wright, Marple, and Beck[1] report an incidence of 9.7 per cent, and, from a review of the literature, they report an incidence of diabetes from 7.9 to 23.7 per cent among all persons suffering acute myocardial infarction.

Mortality studies

The number of patients with myocardial infarction who survived and those who died is shown, according to treatment, in Table IV.

As the actual number of cases not treated with anticoagulant drugs was small in the Detroit series, the mortality rate in the control group (Table V) is questionable.

Statistical study of the Detroit series, in relation to that of the Committee on Anticoagulants, demonstrates that these series may be compared within levels of statistical significance.† Therefore, the mortality experience of other workers, particularly in relation to patients not treated with anticoagulants, can be utilized as substitute controls in the Detroit series.

†Comparison of standard deviation, means of age, and sex ratios of this series with that of the Committee on Anticoagulants was made on the basis of statistical consultation with Dr. C. K. Tsao, Wayne University, Detroit, Michigan.

TABLE IV—MORTALITY ACCORDING TO TREATMENT

Anticoagulant Group		Nonanticoagulant Group	
Lived	Died	Lived	Died
152	21	27	24

The mortality rates in the Detroit and in other series of treated and control groups is presented in Table V.

TABLE V—MORTALITY RATES

	Control %	Treated‡ %
Committee on Anticoagulants[1]	23.4	16.0
Cook County Hospital[7]	24.3	20.9
Vanderbilt University[8]	40.2	15.9
Mayo Clinic[9]	13.0	11.0
Mt. Sinai Hospital[10]	26.2	12.7
Henry Ford Hospital[11]	25.6	14.3
Detroit series§	47.0	12.0

‡Excludes all deaths in 24 hours or less (11 in this series).
§This series observed only during hospital stay; other series observed 6 weeks.

Patients in the Detroit series have been further classified into good-risk (Class I) and poor-risk (Class II), according to the criteria of Littman,[12] modified from those of Russek and Zohman.[13] The criteria for poor-risk patients are:

Age greater than 60 years
History of previous myocardial infarction
Presence of congestive heart failure
Persistent shock
Intractable pain or high fever
History of previous thromboembolic disease
Presence of atrial fibrillation
Peripheral vascular disease; that is, thrombophlebitis.
Venous inflammation or thrombosis

The distribution of cases in this series into good risk and poor risk is shown in Table VI.

TABLE VI—CLASSIFICATION ACCORDING TO RISK

Anticoagulant Group		Nonanticoagulant Group	
Good risk	Poor risk	Good risk	Poor risk
82	91	18	33

Comparable mortality rates in good-risk and poor-risk cases in the Detroit and in other series are shown in Table VII.

TABLE VII—MORTALITY RATES ACCORDING TO RISK IN ANTICOAGULANT GROUP

	Class I %	Class II %
Committee on Anticoagulants[1]	1.8	19.4 (6 weeks)
Russek and Zohman[13]	3.1	60.0 (8 weeks)
Detroit series	3.6	19.7 (hospital stay)

The mortality rates in the good-risk and poor-risk cases in the treated group and the nontreated groups are given in Table VIII.

TABLE VIII—MORTALITY RATES ACCORDING TO RISK AND TREATMENT

	% Deaths in Anticoagulant Group	% Deaths in Nonanticoagulant Group
Good risk	3.6	11
Poor risk	19.7	47

Bleeding complications

In this series, there were two episodes of major hemorrhage necessitating discontinuance of therapy and administration of coagulants (Mephyton); there were five episodes of minor hemorrhage necessitating only the administration of coagulants. The two major hemorrhages were gastrointestinal in origin and one patient developed severe ecchymosis in both flanks. The minor hemorrhages occurred either as hematuria or hemoptysis. In several instances the prothrombin time was inadvertently allowed to rise to 70 to 80 seconds without the occurrence of overt hemorrhage.

The incidence of hemorrhagic complications in the Detroit and in other series is shown in Table IX.

TABLE IX—HEMORRHAGIC COMPLICATIONS

	No. of cases observed	% of cases with bleeding
Cook County Hospital[7]	76	5.3
Vanderbilt University[8]	74	2.7
Mayo Clinic[9]	100	8.0
Mt. Sinai Hospital[10]	142	5.6
Detroit series	173	4.0

Thromboembolic complications

Wright, Marple, and Beck,[1] in studying the incidence of thromboembolic complications, included cases of proved and probable complications diagnosed clinically, thus eliminating those which were first diagnosed at autopsy. In the Detroit series, all thromboembolic complications diagnosed clinically or at autopsy, including both proved and probable cases, were selected for study. This method was selected in order to demonstrate the maximum possible incidence of thromboembolic complications.

The Detroit series shows an incidence of 17 extracardiac thromboembolic complications in 235 patients, a total incidence of 7.2 per cent. This includes all pulmonary emboli, cerebral emboli, peripheral and visceral emboli, and venous thromboses. However, no effort has been made in this group to include extensions of the original infarction or new infarctions (intracardiac) as thromboembolic complications, which undoubtedly reduces the over-all incidence.

Wright, Marple, and Beck[1] reported an incidence of extracardiac thromboembolism of 8 per cent in treated cases and 26 per cent in untreated cases. The comparable rates in the Detroit group are 3.7 per cent in the treated cases and 17.3 per cent in the untreated. Of the untreated cases, 80 per cent of thromboembolisms were pulmonary emboli, whereas only 16 per cent were pulmonary in the treated group.

Autopsy findings

Forty-eight deaths occurred in the Detroit series, 11 in 24 hours or less. Autopsy was performed in 26.

A total incidence of ventricular aneurysms of 27 per cent was noted. The review by Schlichter, Hellerstein, and Katz[14] reveals an incidence of 20 per cent in 512 cases of myocardial infarction in which autopsy was done. In other investigations the incidence ranges from 5 to 38 per cent.

One or more mural thrombi were found in 13 cases, a total incidence of 50 per cent. Of these, 46 per cent occurred in untreated cases, and 54 per cent occurred in treated cases.

Three cases (11.1 per cent) of pulmonary embolism were found. It is only in the cases of frank embolization that the pelvic and leg veins are routinely examined at autopsy by "milking." Since the veins of the legs are generally considered the most frequent site of phlebothrombosis, it is entirely possible that the actual incidence of thromboembolism would be increased if the veins were routinely examined.

Wright, Marple, and Beck[1] reported an incidence of mural thrombi of 31.7 per cent in treated cases and 62.5 per cent in the untreated group.

In the Detroit series 2 patients died of cardiac rupture with hemopericardium; neither had been receiving anticoagulant therapy.

One study[15] demonstrates a twofold increase in the frequency of myocardial rupture in patients receiving anticoagulant therapy. Wright, Marple, and Beck[1] conclude that the difference in the death rate in treated and untreated cases with rupture as a major or contributing factor is real, even though small, under good management.

An effort has been made to test the statement of Beck and Leighninger[16] that 90 per cent of deaths from coronary artery disease occur because the heart becomes electrically unstable ("mechanical" cause) and 10 per cent because of extensive myocardial degeneration; the latter die in circulatory insufficiency.

The testing was done by making two basic assumptions: (1) Right lung weight over 570 mg. and left lung weight more than 480 mg. indicated pulmonary edema,[17] thus indicating congestive heart failure. (2) Death after the advent of ventricular fibrillation is so rapid that pulmonary edema is not apt to accumulate in more than minimal quantities. The findings made from the application of the foregoing assumptions showed the basic cause of death to be of "mechanical" origin in 26 per cent and "muscle" in 74.

Discussion

It has been demonstrated by many studies that anticoagulant therapy seems to be of definite value in the reduction of mortalities due to myocardial infarction. However, divergent views are still held. Garb[18] concludes that "any physician who decides to use Dicumarol for almost all cases of myocardial infarction can find abundant evidence to justify his course. On the other hand, the physician who decides not to use this drug can also logically support his position."

Anticoagulant therapy has been utilized in more than eight of every ten cases of myocardial infarction in the Detroit Osteopathic Hospital. Anticoagulants have been withheld from only those individuals for whom they are contraindicated. The usual method employed at this Hospital is administration of Depo-Heparin, 200 to 400 mg. initially, followed by 100-200 mg. every 8 to 12 hours, depending on the Lee-White coagulation time. Usually, the coagulation time is held at 2.5 to 3 times normal. Depo-Heparin is used for 48 to 72 hours, or until the prothrombin time (Simplastin method as described by Warner-Chilcott Company) is within 10 to 30 per cent of normal. The initial dose of

200 to 300 mg. of Dicumarol is given with the first injection of Depo-Heparin; 200 mg. are given on the second day, 100 mg. on the third, and thereafter daily as needed to maintain the prothrombin time constantly between 10 to 30 per cent of normal.

Alternate methods of treatment used on occasion are: (1) Tromexan initially, followed by Dicumarol, (2) aqueous heparin initially, intravenously or subcutaneously, followed by Dicumarol, (3) Hedulin throughout, (4) Coumadin sodium throughout.

Other drugs and therapeutic agents used as indicated in the management of acute myocardial infarction include: (1) oxygen, by tent in 80 to 90 per cent of cases, (2) narcotics, (3) sedatives, especially barbiturates, (4) atropine and/or papaverine, (5) xanthines, usually as suppositories of aminophylline, (6) antibiotics, (7) vitamin E, in the majority of cases as alphatocopherol, (8) digitalis, usually as the digitoxin and gitalin glycosides, (9) quinidine sulfate, orally or intramuscularly, either therapeutically or, occasionally, prophylactically against active ectopic ventricular arrhythmias.

The results (Table V, VII, and VIII) attest to the efficacy of this treatment in lowered mortality rates of the treated as compared to the untreated group and in prevention of thromboembolic complications.

One objection to the use of anticoagulant drugs has been entered on the grounds that earlier ambulation would accomplish the same purpose in materially decreasing the frequency of thromboembolic complications, thus decreasing the mortality rate.

The prevailing attitude in this institution has been one of conservatism. Neither the "chair treatment" of Levine[19] nor actual early ambulation is practiced. Bed activities are sharply curtailed if the patient is febrile or in myocardial failure. However, after this period, relatively free activity is permitted in bed until ambulation is actually instituted by allowing the patient to sit in a chair for increasingly longer periods. Bed rest in this series averaged 17.1 days, during an average hospital stay of 28.4 days.

In this connection, the distinction between the "chair treatment" of Levine and early ambulation lies in actual lifting of the patient from bed to chair. It has been demonstrated[19,20] that cardiac output in the upright, sitting position is 23 per cent less than in the supine position. It should, therefore, be given more serious consideration as a method of management, particularly in less severe infarctions. The benefit derived from the psychologic improvement alone appears to be a marked gain in many cases.

The point has been raised on frequent occasions concerning absence of serious thromboembolic complications, particularly of the type leading to amputations or impaired blood supply in the extremities. In the Detroit series there has been only one arterial embolus and that was to the posterior tibial artery. Wright[21] cites Francisco as showing that in 10 cases classified as good risk and therefore not treated with anticoagulants or inadequately treated, there were one minor and four major amputations. Two patients were left with arterial insufficiency of the legs.

There is no good explanation for the relative absence of serious thromboembolic complications of this nature except that the average bed stay in the Detroit group is less than in the other groups, and the patients are relatively active in bed before ambulation begins. Bedside commode privileges are given to most patients after the first 48 hours.

It may well be that the total incidence of thromboembolism is low because of missed diagnosis. Pulmonary embolism is particularly difficult to detect, and many episodes of undiagnosed minor pulmonary embolism occur. Essentials of diagnosis include a very high index of suspicion, frequent physical examination, critical examination of serial electrocardiograms, and a radiology staff oriented in the proper interpretation of minor findings.[22]

The over-all incidence of mural thrombi in the Detroit series is not unduly excessive. Howell and Kyser[23] report an incidence of 47.7 per cent in 132 patients, and they cite Bean as showing a 47 per cent incidence in 300 patients. The incidence, however, of mural thrombi in the treated cases is excessive. This is explained by inadequate treatment. Several patients died within 24 hours after admission; that is, before anticoagulants could become fully effective. One patient was not treated with anticoagulants for 5 days after the original electrocardiographic diagnosis had been made and substantiated. Another was poorly treated with anticoagulants as the average prothrombin time over 30 days was 34 per cent with frequent lapses from the usual therapeutic range of 10 to 30 per cent of normal. The mural thrombus in this latter case contributed significantly to the patient's death, as it had assumed a ball-valve character, creating a situation physiologically parallel to that of severe aortic stenosis. Wright, Marple, and Beck[1] emphasize that successful anticoagulant therapy must protect the patient at all times of the day and night. Some authors,[15] however, have expressed the opinion that anticoagulant therapy does not reduce the incidence of mural thrombi. This opinion runs counter to the findings of Wright, Marple, and Beck[1] and others,[24] who report an incidence of 31.7 per cent in treated cases versus 62.5 per cent in untreated cases.

Ventricular aneurysms were found in 27 per cent of the cases in which autopsy was done, well within the reported range of 5 to 38 per cent.[25,26] The most recent and authoritative study of this subject by Schlichter, Hellerstein, and Katz[14] reports an incidence of 20 per cent in 512 autopsies of patients who died of coronary artery disease. Extensive study of the literature demonstrates the lack of proper emphasis on this disorder as a complication of considerable magnitude and deleterious effect. Even if they are diagnosed or sought, ventricular aneurysms are viewed more as an interesting anatomic abnormality arising during the course of coronary artery disease.

Ventricular aneurysms are of two types: (1) broad, pouchlike, and having a thin wall usually containing myocardial elements, or (2) saccular type, which communicates with the ventricular cavity through a small ostium; the wall is very thin, consisting only of scar tissue. The former occurs in the early acute stage of myocardial infarction while the latter type occurs during the chronic stage.

Statistical studies of the long-term effects of ventricular aneurysm are quite startling. Clinically, a patient with ventricular aneurysm may remain relatively well, following a course similar to that of patients who have recovered, without complication, from previous myocardial infarction. However, this occurs in less than half of observed cases. The majority of patients develop a clinical picture characterized by intractable heart failure, persistent pain of coronary insufficiency, or by embolism and sudden death; 75 per cent of these patients succumb within 3 years and 88 per cent within 5 years.[14] This is in marked contrast to the usual mortality rate in which two-thirds live over 5

years, two-fifths over 10 years, and one-fifth over 15 years.[27]

Fluoroscopic examination will establish the presence of an aneurysm in many instances. Localized precordial bulges of areas of paradoxial pulsation are sought. Persistent RS-T segment elevations in the electrocardiogram may be of aid.[28] Clinically, the sudden appearance of a systolic murmur at the apex associated with a dull first sound or by the appearance of an ectopic area of precordial pulsation is helpful but not pathognomonic.

It is therefore seen that the appearance of a ventricular aneurysm is more than an interesting pathologic abnormality. It should be sought for and, if found, viewed with concern. How aneurysm formation alters the prognosis in retrograde fashion has been demonstrated.

Levine's chair treatment, by decreasing cardiac output, may well tend to decrease the incidence of ventricular aneurysm. In one study[29] of patients who had had routine chair treatment, no ventricular aneurysms were found in any of the 41 patients who received a thorough fluoroscopic examination on the average of 26 months after recovery from the acute attack.

The crux of the whole discussion of anticoagulant therapy centers about two questions:

1. Are anticoagulants of definite value in the routine management of myocardial infarction?
2. How and why are they of value?

Although there are still a few divergent opinions, on the basis of many statistical studies, a few of which are quoted in this paper, most investigators feel that anticoagulants are of definite benefit.

A smaller number of investigators, as exemplified by Russek and Zohman,[13] agree that anticoagulants are indeed of value if used only in poor-risk cases but that in good-risk cases they produce more complications than their benefits justify. This argument is effectively countered by various studies[30] showing that it is impossible to determine the prognosis of acute myocardial infarction during the first 48 hours following initial observation with enough accuracy to justify withholding anticoagulant drugs unless the onset was 48 or more hours previous to initial observation. Furthermore, anticoagulant therapy, if adequately correlated with daily prothrombin determinations, produces few hemorrhagic complications which cannot be readily controlled. This, of course, excepts the serious complication of hemopericardium. Moreover, anticoagulant therapy substantially lowers the incidence of thromboembolic complications even in good-risk cases.

The second question, as yet, cannot be answered. Wright, Marple, and Beck[1] conclude that the reduction in deaths appears to have occurred primarily as a result of the prevention of thromboembolic complications which would have a fatal outcome. In the Detroit series, thromboembolism with a fatal outcome did not occur in large enough numbers to account for the significant decrease in mortality of the treated over the untreated group. This experience agrees with that of others.[31,32] Kyser[33] has stated that he firmly believes the beneficial effect of anticoagulant therapy results from some other action in addition to its anticoagulating ability, and that, from all published reports, there is no question that embolic phenomena are not the major cause of death, and yet experience indicates that adequate treatment with anticoagulant drugs lowers the mortality.

Other possible pharmacodynamic effects of Dicumarol have been suggested:[18] (1) pain relief in different areas of the body, (2) capillary, arteriolar, and venular dilatation with therapeutic doses in dogs, (3) reduced adhesiveness of blood platelets, (4) increased coronary flow, (5) increased contractility of the heart with relatively large doses in dogs, (6) antipyretic effect, (7) accelerated rate of canalization of thrombi in rabbits, (8) interference with the labilization of platelets.

It therefore appears that the value of anticoagulant therapy may depend upon one of these effects or perhaps on some action as yet undiscovered. In any event, in the Detroit series, the reduction in the mortality rate did not appear to depend upon reduction of deaths due directly to thromboembolic complications.

Summary

A series of 235 cases of acute myocardial infarction has been compared with other series of cases in which anticoagulant treatment was used. Comparison was made of age and sex distribution, incidence of cardiac arrhythmias, bleeding and thromboembolic complications, mortality rates, and necropsy findings.

It appears that the full utilization of anticoagulant therapy in this series has been of decided advantage, as the mortality rate in the treated series was 12 per cent as contrasted with a mortality rate of 47 per cent in the untreated and control group.

The number of thromboembolic complications in this series was substantially lower than in others. The incidence of bleeding complications as a result of anticoagulant therapy was low, and in no case was the outcome fatal.

Discussion has centered about a relatively frequent and neglected complication of myocardial infarction, ventricular aneurysm. Evidence has been cited to demonstrate that this complication seriously impairs recovery from myocardial infarction and, in fact, materially decreases long-term survival. Serious consideration should be given to the chair treatment in the management of selected cases of myocardial infarction.

Agreement has been reached by most investigators that anticoagulant therapy is of definite value in decreasing mortality rates. No agreement, however, has been reached as to the reason for this decrease.

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ELECTROMYOGRAPHY

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In 1851 SCHIFF,[1,2] a German scientist, sectioned the nerve supply to the tongue of an animal. On the fifth day he noticed that the muscle fibers began to fibrillate spontaneously. He observed that this activity decreased as fibrosis developed and also when the nerve regenerated. This phenomenon is not visible through the skin. Brown[3] in 1937 and Denny-Brown and Pennybacker[4] in 1938 noticed fibrillation potentials, the unit in action appearing to be from a single muscle fiber. Eccles[5] in 1941, using a refined method of recording, substantiated this impression. It was also noted that in man the fibrillation potentials appeared 18 to 21 days following denervation.

Clinical applications

Some clinical applications of electromyography were reported by Huddleston and Golseth[6] in poliomyelitis in 1948; by Huddleston and others[7] in 1950 in lower motor neuron disease; by Shea, Woods, and Werden[8] in nerve root compression syndrome in 1950; and in 1953 by Marinacci[9] in a review of 2,500 cases in which electromyograms were made. In 1955, Marinacci[10] reported his electromyographic observations in various neuromuscular diseases and injuries after a study of more than 10,000 cases.

Today, the electromyograph is accepted as a valuable adjunct in the diagnosis and prognosis of neuromuscular disorders. It is an aid in identifying disorders of the spinal cord, nerve roots, and peripheral nerves, such as degenerative diseases of the spinal cord, intraspinal tumors, arachnoiditis, nerve root compression, and peripheral neuritis. It is also an aid in the diagnosis of muscular dystrophy and the myotonias.

In anterior poliomyelitis, for example, electromyography can be used not only for differential diagnosis but also to measure progress during recovery. In peripheral nerve injuries, the severity of the lesion can be determined and progress measured during regeneration.

As used clinically, the electromyograph amplifies individual motor unit potentials which are observed on the oscilloscope screen and heard through the loudspeaker. These findings may be photographed or tape recorded for future study.

A motor unit may be described as consisting of an axon, the motor end-plate, and the group of muscle cells supplied by this nerve fiber, usually 150 to 200 cells and possibly as high as 500. When denervation is present, the individual muscle fibers begin to fibrillate after 14 to 21 days and present characteristic wave patterns.

Contact is made through three needle electrodes: a ground, a reference, and the positive, insulated, muscle electrode which has less than 1 mm. of its tip exposed. The instrument can be calibrated so that both the duration and amplitude of the electrical potentials can be accurately measured. The wave patterns and sounds are characteristic and diagnostic.

Cuthbert and Denslow[11] reported on the efficiency of various electrode contacts, in which they observed that a single exploring needle electrode will sample an

area more effectively than will two electrodes. Multiple electrodes, on the other hand, are more effective in research when it is necessary to observe such things as whether or not there are any action potentials while a muscle is at rest. They also observed that patient positioning was important when resting muscles were being sampled, since stretch reflexes had to be avoided. This can be accomplished by having the subject recline in the supine position with the knees and arms slightly flexed in a position of absolute comfort.

The identification of the wave patterns and the mechanics of operation of the instrument are relatively simple, but the technic of examination and the interpretation and correlation of findings require a thorough knowledge of neurology and kinesiology. Since electromyographic evaluation is accepted by insurance companies and courts of law, it is imperative that the operator be competent and well-trained. This is of particular importance since a majority of the patients who are referred for examination are problem cases, many of which are ultimately settled in court. The operator must therefore be prepared to appear in court as the occasion demands and qualify as an expert witness.

Although the electromyograph is of particular value in lower motor neuron disease or injury, it has been used at the Rehabilitation Center of the College of Osteopathic Physicians and Surgeons to determine the extent of damage following cerebral vascular accidents. At the same time, the instrument may be of aid in training these patients to send voluntary nerve impulses to the affected areas when improvement is not satisfactory. Frequently, some nerve pathways are intact, but the patient is unable to send the specific impulses to activate them. The electromyograph supplies the necessary aid to accomplish this by permitting the patient to observe the effects of his efforts on the screen.

Cooperation of the patient is essential in performing adequate evaluations with the electromyograph. Infants and young children make unsatisfactory subjects unless they are unusually cooperative. The patient must be relaxed if denervation fibrillation potentials are to be identified.

It must be remembered that a period of at least 3 weeks must elapse following nerve injury before accurate evaluations can be expected.

Examples of utilization

Frequently, following an apparently minor injury, the patient may continue to complain of discomfort or weakness in an extremity.[12] Clinically, the findings may be inconclusive, and the question arises as to whether the patient is a malingerer. The following cases serve as an example.

A male patient, aged 50 years, severed the tendon of the flexor pollicis longus while working as a carpenter. First aid consisted of suturing the severed tendon and placing the hand and wrist in a plaster cast for about 3 weeks. When the cast was removed the thumb was greatly restricted in motion, particularly in flexion.

Heat and exercises were prescribed, but after a period of several weeks there was little, if any, improvement. The patient was referred to the physical medicine and rehabilitation service where an electromyographic examination was made, since there had been some suspicion that he was malingering.

Upon examination the patient was found to have partial denervation of the abductor pollicis and the flexis pollicis brevis muscles. Institution of sine wave treatments, hydrotherapy, and graduated exercises resulted in gradual recovery, and he was able eventually to return to his regular occupation.

In another case,[13] a worker was injured when a beam fell across his shoulder causing damage to the brachial plexus. Under treatment he gradually improved, but in the meantime he developed restricted motion in the right shoulder. He was given a general anesthetic and the shoulder was mobilized. Soon thereafter he developed a flexion contracture of the fourth and fifth fingers of the injured extremity. When treatment failed, he was referred for electromyographic evaluation.

Examination of this patient showed normal innervation of the muscles in his affected extremity. When he attempted voluntary extension of the involved fingers, many voluntary normal motor unit potentials were observed in the extensor muscles of these fingers. It was concluded that the patient was malingering. Further inquiry into the history supported this conclusion.

In other cases the electromyograph has proved of value in determining the extent of the lesion.

A patient who had been a painter for many years complained of weakness in his right foot. The tentative diagnosis was lead neuropathy. He was referred for electromyographic evaluation. Upon a thorough sampling of all extremities, no denervation was found except in the right tibialis anterior muscle. It was therefore concluded that the true diagnosis was mild right peroneal nerve palsy which was probably due to pressure while habitually sitting with knees crossed.

Conclusions

The electromyograph is to peripheral nerve injuries and regeneration what x-ray visualization is to bone fractures and healing. The level of the lesion can be easily determined and the degree of involvement estimated as mild, moderate, severe, or complete.

As an aid in differential diagnosis it is invaluable, particularly in cases where the clinical findings are inconclusive.[14]

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Fig. 1. Electronic apparatus developed to yield a continuous record of multiple physiologic phenomena. The apparatus was designed for studies on living human beings and records on a single sheet the simultaneous activities of a number of physiologic variables during experimental conditions.

An electrophysiologic

RESEARCH INSTRUMENT

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AN ELECTRONIC APPARATUS has been developed which yields a continuous record of multiple physiologic phenomena. This apparatus was designed for use in a series of studies of the whole man, alive, and records on a single sheet the simultaneous activities during experimental conditions of the following physiologic variables:

1. Electroencephalograms, from one to six channels.
2. Integrated electromyograms, from one to six channels.
3. Electrocardiograms, from one to three channels.
4. Instantaneous heart rate.
5. Psychogalvanic skin resistance, from one to three channels.
6. Direct current amplifiers having a sensitivity of at least 10 millivolts per centimeter deflection, from one to six channels, for dynamometers, oximeter, spirograms, temperatures, pressures, and movements.
7. Signal marker.
8. Record numbering.

In addition to the ink recordings, data are presented visually and aurally and recorded on electromagnetic tape.

The instrument is shown in Figure 1. In this figure, the subject is seen to be exercising his right arm, following the tape-recorded instructions of the technician. Electrical impulses from the subject's arm muscles, brain, and heart are picked up through electrodes attached to the skin. A photoelectric cell and light source attached to the lobe of the right ear deliver oximeter signals. Electrode leads pass to a terminal board, shown in Figure 2, which is movable and can be located remotely from the remainder of the apparatus.

Signals through the twenty-three-pole terminal board are carried through a 12-foot shielded cable to a calibrator (Fig. 3), then to a low noise preamplifier and direct current amplifier, and then to the recording instruments. The calibrator consists of six selector switches which connect the circuits between the terminal poles and six preamplifiers and direct current amplifiers. Electrode resistance and signal strength to the writing pens are indicated on an ohmmeter and a voltmeter. Twelve chopper-type, direct current utility amplifiers are incorporated in the instrument. Six, operating at 30 to 6,000 cycles per second, are used for electromyography. These drive six of the writing pens, as controlled by an equalizer. The other amplifiers, operating at 0 to 100 cycles per second, are used for electroencephalography, electrocardiography, earopacity, galvanic skin response, and amplification of strain gauge potentials. These can drive six pens, and selection is made through a ninety-two patch-control panel, not shown in the illustrations.

The nature of any of the impulses, except the strain gauge and other mechanical measurements, can be examined by viewing the oscilloscope screen and can be photographed in the manner shown in Figure 4. Electromyographic activity of each of the muscles under observation can be heard through tuned speakers, which are seen in Figure 5, through the opened instrument panel.

Action potentials can be recorded on magnetic tape. The tape can then be replayed to show the nature of the potentials on the oscillographic screen and can be easily stored for later study.

The continuous physiologic impulses and mechanical changes are recorded simultaneously by electrodynamic ink writing pens on 24-inch paper moving at speeds of 0.5, 1, 2.5, 5, 10, and 25 mm. per second. The paper drive accommodates sixteen channels.

The entire system operates from regular 115 volt alternating current mains operated from a triple regulated power supply which furnishes both filament and plate supply power.

It is proposed to develop the apparatus further by the addition of miniature transmitting equipment which will send physiologic signals by short wave radio. This will free the subject from the apparatus, except for the fine electrode leads and the small transmitter which can be worn with comfort. When this telemetering system is complete, it is envisioned that a photographic recording system will be developed to print televised observations in color on a film, together with continuous or sequential radio-transmitted physiologic data. All channels of information will be recorded on magnetic tape, using multicolored oscillographic projection

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Fig. 2

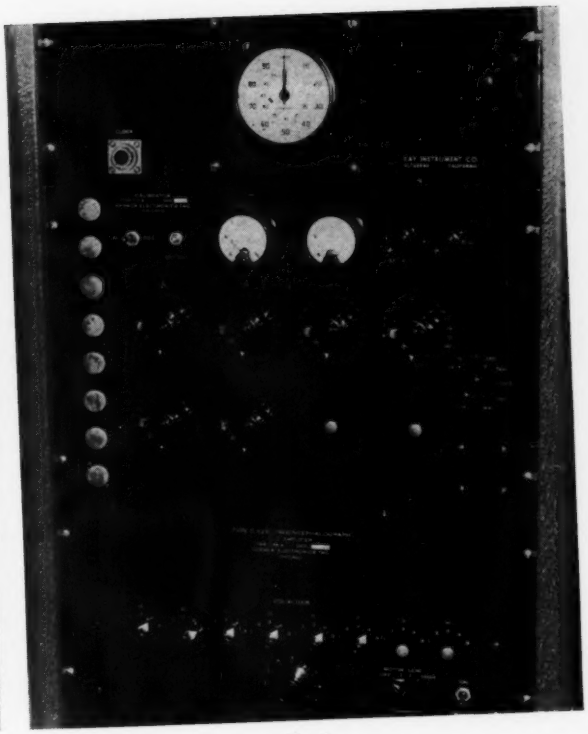

Fig. 3

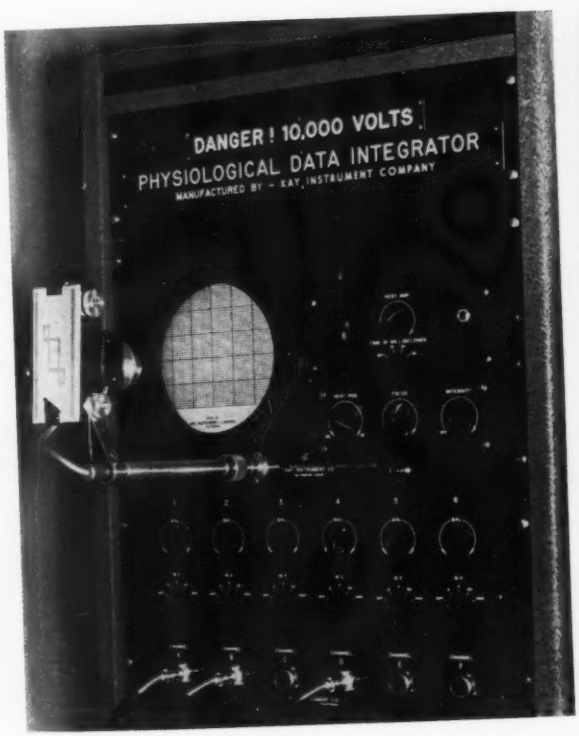

Fig. 4

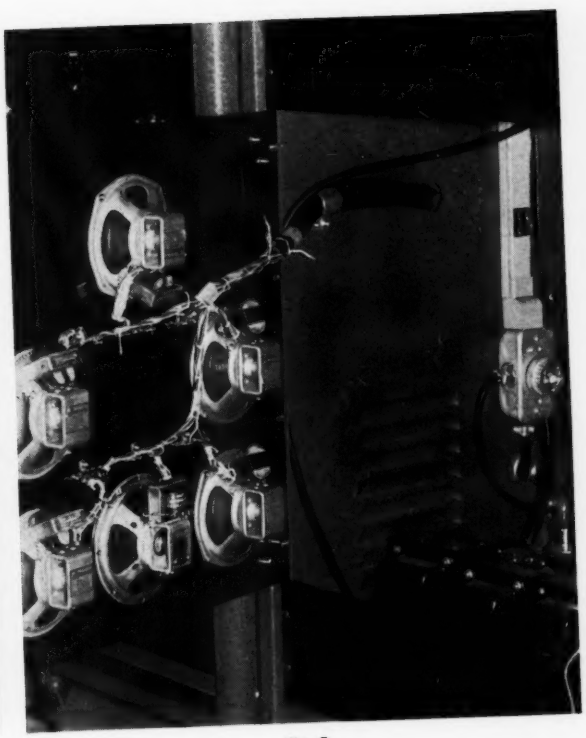

Fig. 5

technics for monitoring, observation, and playback. New developments in electronics and photography are making possible objective studies of the total responses of an individual to experimental conditions. These mark a new advance in human research.

1721 Griffin Ave.

CONGENITAL dysplasia of the hip joint in the newborn*

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THE MEMBERS OF THE Radiology Department at the Hospitals of the Philadelphia College of Osteopathy decided in 1953 to investigate the subject of congenital dysplasia of the hip joint in the newborn. One hundred infants were to be studied radiographically and clinically, and the findings correlated and compared with previous investigations. The purpose of this paper is to review the embryology and anatomy of the hip joint and the possible etiologic factors involved in congenital dysplasia of the hip and to present the statistics of this study.

Embryology

About the third week of fetal life the limbs appear as short ridges.[1,2] The appendicular skeleton seems to be derived directly from the unsegmented somatic mesenchyme rather than from the sclerotomes. The primordia then pass through a cartilaginous stage following which they transform into bone.[3]

An ovoid plate of cartilage forms at right angles to the vertebral column.[4] This cartilaginous plate of the coxal bone later rotates to a position parallel with the vertebral column and then shifts slightly caudad which brings it into relationship with the first three sacral vertebrae. Three main centers of ossification appear and gradually develop into the primitive ilium, ischium, and pubis.[3]

At about 7 weeks the acetabulum begins to hollow out by the fusion centers, and about the ninth to tenth week there is definite indication of the hip joint.[5] It has been found that the femoral head remains globular during development. Apparently dislocation cannot occur before the opening of the joint cavity during development.[6]

Anatomy

The hip joint is a diarthrosis (simple, spheroidal enarthrosis). The motion is mixed—gliding, rolling, and rotation. It is a typical example of a ball-and-socket joint with the cup-shaped acetabulum receiving the almost spherical head of the femur. Both articular surfaces are coated with cartilage. Its great strength depends upon the depth of the acetabulum and upon the fact that its mouth is reduced in width by a fibrocartilaginous circular band called the labrum glenoidale or limbus which attaches to its margin, upon the tension and strength of the ligaments, upon the length and oblique direction of the neck of the femur, upon the strength of the surrounding muscles, and upon atmospheric pressure.

The strong articular capsule is strengthened by three main auxiliary ligaments, actually thickened portions of the capsule, that are blended intimately with it: (1) the iliofemoral, (2) the ischiocapsular, and (3) the pubocapsular. There is also the zona orbicularis which is a ring embracing the neck of the femur and the transverse ligament of the acetabulum across the acetabular notch to complete the rim of the acetabulum. The ligamentum teres is a flat band from the acetabular fossa to the head of the femur and is about 3.5 to 3.7 cm. in length. Its function is not definitely established, but apparently the ligament does not offer much retaining support. However, the articular capsule is considered one of the strongest ligaments in the body. It is attached to the rim of the acetabulum and to the femoral neck so that most of the anterior portion of the neck is covered and about three fifths of the posterior portion. Bigelow[7] estimated a strain of 250 to 750 pounds was necessary to rupture the iliofemoral ligament; rupture rarely occurs.

Etiology

The true etiology of congenital dysplasia of the hip joint is as yet unknown. According to Hart,[8,9] primary factors are probably genetic, biologic, and mechanical with some part due to other factors such as nutrition, fetal position, prematurity, hormonal influence, and, in certain countries, the custom of binding the infants extremities.

Massie and Howorth[10] consider that relaxation of the capsule is the prime factor and that this is probably due to genetic, mechanical, hormonal, or nutritional factors. Caffey[11] also considers relaxation the main cause, but considers hypoplasia of the roof of the acetabulum to be present in dislocation. Chapple and Davidson[12] considered the hormone, relaxin, known to be present in the mother at the time of delivery and allowing enlargement of the outlet by ligament relaxation, to affect the fetus. They considered dislocation to be due to a mechanical factor, late intrauterine position. This could also be a factor in dysplasia, but it is probably associated with relaxation of the capsule and failure to maintain pressure of the femoral head in its

*This paper was prepared in partial fulfillment of the requirements for certification by the American Osteopathic Board of Radiology.

socket, which apparently is necessary for proper growth.

Genetic factors have been found to be involved in about 20 per cent of cases.[8,13] The rotation of the limb buds, as noted above, may be affected and cause anteversion of the femoral head, producing a flat socket. The acetabular defect is usually posterior and inferior or superior. Badgley[13] in reviewing hips of embryos, could not conclude that heredity could affect only a portion of the hip.

Pugh[14] and Hart[8] think most cases of dysplasia are due to hypoplasia of the acetabulum. However, the femoral head may be the developmental cause, and dysplasia is an interruption of normal endochondral ossification of the hip joint as a whole.

Incidence

Dysplasia occurs almost as frequently in males as females, although frank dislocation is six to eight times more frequent in females,[11,14] probably because of the more perpendicular shape of the innominate bone and the normally greater shallowness of the acetabulum. Also, delayed ossification seems to occur more frequently in the female than in the male.[12] Pugh[14] found unilateral dysplasia twice as common as bilateral. Schinz and his associates[15] found dysplasia was 1.75 times more frequent in females and was bilateral more often than unilateral.

Clinical evaluation

A complete summary of clinical findings has been prepared by Hart[9] and is listed below:

1. Sign of the jerk or click
   a. Jerk of entry
   b. Jerk of exit
2. Postural shortening or contracture of the adductor muscles, tendons, and fasciae results in the following when the infant is suspended under the axillas:
   a. Adduction and slight flexion of the extremity
   b. Apparent shortening of the leg
   c. Rotational attitude of the leg
   d. Asymmetry of the labia and of the inguinal folds and creases (deeper and more cephalad inguinal crease)
   e. Asymmetry of the gluteal folds and creases (deeper and more cephalad gluteal crease)
   f. Additional and deeper adductor skin folds and creases
   g. More cephalad knee, popliteal, and ankle creases
   h. Obliquity of the pelvis and prominence of lateral aspect of the hip region
   i. Absence of pain, inflammation, and muscle spasm
3. Manipulation shows limited passive abduction of flexed hip. In displacement of the femoral head from the acetabulum there will be an actual or apparent telescoping effect, and shortening from the pelvis to the knee.

According to Hart,[8] Ortolani's "sign of the jerk" of entry is the earliest positive and pathognomonic sign of congenital dysplasia or dysmorphia of the hip joint with ectopia of the head of the femur.

Materials and methods

In the case studies reported here, radiographic examination was made by means of a mobile machine in the nursery. The factors were an average of 64 kilovolts, 20 milliamperes, and 1/8 second at a distance of approximately 22 inches. Transverse 8-by-10-inch films were secured with the infant in the supine position, as straight as possible, the toes and patella upward, and with the center of the film approximately 1 finger breadth above the pubes.

A test film was secured of a flat piece of cardboard on which three fine wires bent at an angle of 25 degrees were placed. These were spaced to project at the center and ends of the film. The cardboard was above the film at approximately the level of the infant's hip. It was found with the technic utilized that there was no appreciable variation of the angles measured on the film although Massie and Howorth[10] report the possibility of a 2-degree variation of the acetabular index because of poor centering.

The acetabular index was measured after the manner of Hilgrenreiner[16] and Kleinberg and Lieberman.[17] This consists of the angle formed by a horizontal line (the Y-line of Hilgrenreiner) drawn through the lower portion of the acetabular portion of the ilia and a vertical line drawn through the lateral margin of the acetabulum.

Numerous lines, angles, and measurements are utilized in radiographic evaluation of dysplasia of the pelvis and hip joint in infants, but most of these are subject to error due to lack of precise positioning at the time of filming. These are thoroughly considered by Hart[8] and will not be listed here. It was considered that determination of the acetabular index along with evaluation of Shenton's line was the most satisfactory procedure for the newborn. Shenton's or Menard's line is the line in the normal hip extending in an even arc from the medial border of the neck of the femur around medially to the superior border of the obturator foramen. The line is broken and interrupted when there is femoral head displacement, and since in the newborn the center of ossification of the femoral head is not normally present, evaluation of this line may be a most helpful clue. If it is abnormal, then it is best to repeat the examination. If the findings of the two examinations are similar, then additional measurements should be applied.

In these cases, clinical evaluation is of the utmost necessity. In fact, it should be the clinical evaluation which prompts the roentgen evaluation. Although in the newborn roentgen findings may not be too conclusive, the additional information obtained may be enough to warrant early institution of treatment. This is most important since the sequelae of dysplasia may be prevented by early treatment, and, also, early treatment is relatively simple.

Another radiologic procedure which may be employed in the newborn is hip joint arthrography. Its utilization in this country has not been extensive. Severin,[18] in Europe, found that arthrography of the hip could be utilized for differentiation of dysplasia, subluxation, and dislocation. Visualization of the shape and size of the femoral head is possible, as are evaluation of the cartilaginous roof, adaptation of the femoral head to the acetabulum, width of the capsular ligament and visualization of the ligamentum teres and location of the limbus. Somerville[19] found the limbus inverted into the joint in all hips explored for complete dislocation. In this country, Kenin and Levin[20] using 20 per cent Diodrast have developed a procedure they consider safer than those used in Europe. Usually 1 to 2 cc. of radiopaque material is all that is necessary, and the study is made under general anesthesia.

They consider this to be one of the best applications of arthrography and feel that often the impression of an experienced observer, based upon physical findings and conventional roentgenograms of the hips, has been proved erroneous by use of arthrography. Their technic has not been hazardous, and they believe that in this country hip arthrography has not been given the attention it merits.

In this country, Heublein, Greene, and Conforti[21] also consider that conventional films are not conclusive in full evaluation of the cartilaginous radiolucent portions during the first 6 months of life and have been utilizing arthrography. This procedure has also been used after open reduction of dislocations in order to evaluate the position of the internal structures of the hip which cannot be seen on conventional films.

For the study reported here, postnatal x-rays of the hip joint were made of 100 consecutive infants on the service of one pediatrician during 1953. The acetabular angle was measured and recorded with the hospital number and date. All of the patients were white. The films were made 1 to 6 days after birth; the average was about 4 days. There were 5 premature infants, and in these cases films were taken from 11 to 34 days after birth. The diagnosis of prematurity was based on weight and length. There were 59 males and 41 females. The criterion for consideration of dysplasia was an angle of 30 degrees or more. This is in accord with Kleinberg and Lieberman[17] who considered 27.5 degrees a normal index for the newborn. They, however, considered as probably normal an angle greater than 30 degrees in the premature. Massie and Howorth[10] considered the normal range to be 30 degrees in infants under 1 year of age, 25 degrees in children between 1 and 3 years, and 20 degrees in those over 3 years. They also found the obliquity to be 1 to 4 degrees less in males than in females.

Statistics

In this study it was found that the average angle in the females was 24.8 degrees for the right hip and 27.6 degrees for the left hip. This was an average angle of 26.2 degrees for both hips in the forty-one females.

In the male, the angle for the right hip was 24 degrees and for the left hip 25 degrees. This was an average angle of 24.5 degrees for both hips in the fifty-nine males. Therefore, the average angle for the 100 patients was 25.3 degrees. This is 2.2 degrees lower than the average reported by Kleinberg and Lieberman.[17]

It was found that the smallest angle in the females was 19 degrees and in the males 15 degrees. The greatest angle in the females was 35 degrees and in the males 33 degrees.

The angles found in the premature infants were interesting (Table I).

TABLE I—ACETABULAR ANGLE IN PREMATURE INFANTS

Sex	Age	Right Hip, Degrees	Left Hip, Degrees
Male	33 days	22	24
Male	11 days	23	29
Male	25 days	15	16
Male	20 days	19	20
Female	34 days	24	26
	Average	20.6	23
	Average of both hips		21.8

These figures seem to dispute the statement that in the premature an angle greater than 30 degrees may be normal.[17] The only plausible explanation I can offer for the smaller angle in premature infants is that the hormone, relaxin, may not be as abundant at the time of delivery so that capsular relaxation has not occurred; the intrauterine position and less restriction of motion of the smaller fetus may also be factors.

In this group of 100 cases there were twenty-three in which the acetabular angle was 30 degrees or over. Of the twenty-three patients, fifteen were female and eight were male. In eleven of these twenty-three cases the angle was over 30 degrees; there were ten females and one male. These twenty-three cases were classified as dysplasia according to the criteria of the study method utilized. A review of the clinical findings showed two of these cases to have sufficient signs to warrant a final diagnosis of congenital dysplasia of the hip. In one case the right hip measured 33 degrees and the left hip 31 degrees. In the other case the angle of each hip was 30 degrees. Both these patients were females. They were treated by immobilization in abduction and responded well; roentgen examination recently showed the acetabular indices and epiphyses were normal. In the remaining twenty-one cases there has been no clinical evidence of congenital dysplasia. In four of these cases follow-up lung x-rays were made, and in one the infant's feet were x-rayed because of suspected varus deformity. Of the remaining seventy-seven patients, two have been re-evaluated because of gluteal crease variation, but no other physical signs of dysplasia were noted, and the acetabular indices were found to be normal.

It was found in this study of 100 consecutive infants that 2 per cent showed clinical and radiologic evidence of congenital dysplasia of the hip. An additional 21 per cent radiologically showed evidence of dysplasia, but these findings could not be corroborated clinically. This 21 per cent can be put into the category of potential or latent hip joint disease. Putti[22] has promulgated the idea that dysplasia in so-called normal hips in children has been the cause of adult hip disease. If the angle is more than 30 degrees it has been considered that dislocation will probably develop. Enough time has not elapsed since this study for substantiation of this statement.

Conclusions

From a review of the literature on congenital dysplasia of the hip joint, there seem to be many areas left for investigation. The etiology is still not well founded. A more critical and extensive study of the embryologic factors would be valuable. Clinical awareness along with roentgen confirmation is necessary at an early stage in order that treatment can be instituted. Hip joint arthrography should probably be employed more extensively in this country for more definitive diagnosis. The acetabular index must be correlated with clinical findings in order to establish a positive diagnosis of dysplasia. Suspected dysplasia in childhood should be considered as a potential for hip joint disease in maturity. Of the 100 cases studied, 2 per cent showed positive evidence of dysplasia, both clinically and radiographically.

Summary

Congenital dysplasia of the hip joint is believed to be due to genetic, biologic, mechanical, and other

factors, such as nutrition, fetal position, prematurity, hormonal influence, and relaxation of the capsule.

The incidence is probably as great in the male as in the female, although in the female the acetabular angle is usually increased, and the number of frank dislocations is six to eight times greater in females.

The most important clinical signs are the "sign of the jerk" and postural shortening or contracture of the adductor muscle, tendons, and fasciae, which result in many clinically visible signs.

The technic employed for the evaluation of the 100 cases in this study has been described. The acetabular index was the main criterion.

In 2 per cent of the infants studied (both females) a positive diagnosis of dysplasia was made from combined roentgen and clinical signs. Roentgen signs without clinical signs were noted in 21 per cent: 13 females and 8 males. This study would indicate that the female is more prone to dysplasia.

Premature infants showed a decreased acetabular index.

247 S 38th St.

Acknowledgment

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CRANIAL pathology in the NEONATAL period*

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THE DUTY OF ANY physician is, first, to recognize the average or normal in physical form, function, and behavior; second, to have a high index of suspicion for the abnormal in form, function, and behavior; and third, to recognize pathology for what it is, for what it has done already, and for what it threatens to do. Particularly in cranial disorders of infants is success in carrying out this duty, and in treatment, satisfying.

I shall first discuss cranial injuries and follow with a discussion of developmental defects as they apply to the nervous system.

Cranial injuries

Caput Succedaneum.—Caput succedaneum, edema of the scalp, results from long-continued pressure on the fetal head during labor.[1] The disfigurement is temporary and benign unless it is an external sentinel of greater molding as yet invisible within the skull. No specific therapy is necessary.

Cephalhematoma.—Cephalhematoma is a collection of blood under the galea; it is not infrequently a minor complication of a troublesome delivery or following a linear fracture of the parietal area. Spontaneous absorption usually occurs, but if the scalp continues taut and tense, the area must be shaved, asepticized, and punctured with a stilet needle and the clot evacuated. A compression bandage is kept in place for a week. There is danger of infection and a resultant indolent burrowing sinus of the scalp or of disfigurement caused by calcification.

Fractures and Skull Defects.—

Not infrequently a newborn has received a ping-pong ball fracture of the skull as the result of extreme molding by the maternal pelvis, forceps application, or even digital force during delivery. Corrective surgery should be done within approximately 48 hours of delivery whether or not the infant is full term, providing its temperature can be controlled. I have performed this operation using a local anesthetic and a sugar-water nipple. The surgical procedure should not begin until the intravenous needle is in position, even if a cut-

*Presented at the Twenty-Fourth National Osteopathic Child's Health Conference and Clinic, Kansas City, Missouri, April 11, 1956.

Fig. 1

Fig. 2 Fig. 3

down is required, for a patent pathway must be maintained to the heart for fluids and to the brain for temporary narcosis. A burr trephine at the edge of the crater allows an extradural leverage elevator to snap or, in my experience, gradually to work the depressed apex into its normal contour. Sometimes only a scissor incision from the trephine opening to the apex is necessary to effect conformity.

Basal fracture is suggested by orificial bleeding, cerebrospinal rhinorrhea or otorrhea, or by Bell's palsy. In the patient in Figure 1, fracture occurred at the petrous and mastoid areas of the temporal bone homolaterally.

Treatment in basal skull fracture consists of physiologic bed rest, attention appropriate to the neurologic status, and the use of penicillin for 10 days or longer if fever, meningeal signs, or spinal fluid leakage is present. The case is treated as a closed head injury. If deep scalp lacerations and/or comminuted or depressed skull fracture is found (Fig. 2), especially in any street accident—to a baby or to an adult, immediate treatment consists of control of external bleeding. With the use of antibiotics delay of surgery is safe, and it should be postponed until a competent neurosurgical operating team can be assembled and initial surgery can then be definitive.

Even in gross skull injuries in infants, if the dura is intact, the contaminated bone fragments should be discarded because the skull defect will fill with new bone formed from both the pericranium and dura. In children beyond the age, possibly, of 3 and, certainly, of 5 years, cranioplasty should be performed for (1) congenital skull defects, (2) compound fracture of the skull with sacrifice of bone, (3) severe lead encephalopathy with bone defects due to decompression for severe intracranial pressure, and (4) bone defects resulting from prior operations for skull tumors, infections such as osteomyelitis, or asceptic necrosis[1] (Fig. 3).

Tears of the Tentorium.—

Tentorial tears also must be included in any discussion of cranial pathology of the newborn. They are more easily prevented than treated. Adhering to certain laws during delivery will prevent these tears: (1) the law of the pelvic floor, (2) the law of the forceps, (3) the plane of the forceps, (4) the rule of the forceps, and (5) the rule proposed by Pinder and Mines,[2] regarding the locking point of the forceps—" . . . the locking point directly overlies the triangular fontanel from which the lambdoid and sagittal sutures radiate." Thus, ". . . compression effects will be minimized as the stress will be diffused through the basilar bony structures, sparing to some degree the more compressible cranial components" (Fig. 4.) Such a procedure avoids the compression of the vulnerable vertex and the devastating torsion disruption of ". . . force obliquely applied across the calvaria from the left frontoparietal area to the right parieto-occipital area." (Fig. 5.) These figures amplify the original work of Courville.[3]

Fig. 4

Fig. 5

Courville's illustrations of fetal head compression in the occipitofrontal diameter, in vertex presentation, the aftercoming head in breech presentation, and scaphoid molding with basilar tears in face and brow presentations and compression of vault and base are deserving of close study.

Courville[4] says:

> Tears in the falx cerebri and tentorium of themselves are never lethal in character . . . and produce their ill effects only by lacerating the venous channels in these membranes. At the time of delivery, the inner layer of the dura forming the falx and tentorium contains a greater amount of yellow elastic tissue than it does in later life. This elastic tissue permits a certain amount of stretching without tearing.

Intracranial Hemorrhage.—

Hemorrhage between the skull on the outside and the dura on the inside, that is, extradural hemorrhage, may occur when injury causes a separation of the lambdoidal suture; in neonatal life it may occur in conjunction with tears of the dural veins or dural sinuses, whereas in adults it is usually associated with rupture of the middle meningeal artery. In one series reported by Campbell and Cohen,[5] more than half occurred in the first 2 years of life.

Typical findings include palpable swelling of the scalp, unequal pupils, increasing stupor, weakness of one half the body, a strongly positive Babinski toe sign, and convulsions which are frequently generalized. The patient appears pale and clammy, and both shock and bleeding are present.

Treatment is prompt surgery. Examination by means of a bilateral linear scalp incision and a burr hole is demanded. An arm or leg vein must be prepared for a transfusion. The mortality rate for this procedure is less in infants than in adults. Blood will be evident under the parietal bone or not far from the location of the dural sinuses and always in the locale of the cerebral representation of the neurologic defect, but it is not usually easily observed. I have had some grossly mutilated patients who with prompt surgical care have not suffered any residual effects. A little girl, about whom I reported several years ago, after eight comminuted skull fractures in which cerebellar tissue squeezed like paste through the lacerated skull and scalp, has never suffered even a headache.

Davidoff and Epstein[6] have reported a case in which labor lasted for 23 hours, and the baby's head was severely molded. The baby presented a very difficult feeding problem until he was 4 months of age; in addition, there was enlargement of the head and slow mental development. At the age of 6 years the boy fell and injured his head, and headache, drowsiness, and vomiting followed. Skull x-rays showed some atrophy of the posterior clinoids with separation of the coronal and sagittal sutures. At operation an old subdural hematoma was found and evacuated. It was concluded that the fall potentiated the symptoms, but that the skull findings and the cerebellar pressure symptoms were the result of birth trauma.

In any such case a spinal puncture should be performed; if the procedure is done properly and blood clouds the fluid, it may be the clue to a subdural hematoma. Other neurologic signs will confirm the diagnosis. Sometimes subdural hematomas are overlooked and remain latent for years until they calcify. Figures 6 and 7 are examples.

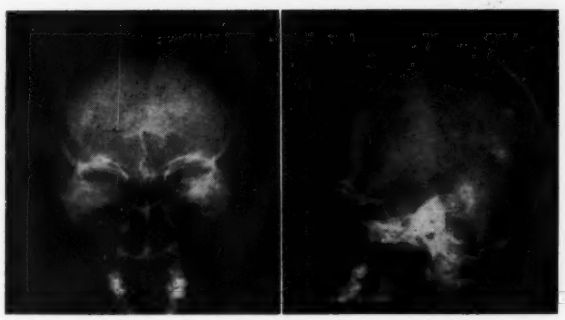

Fig. 6

Fig. 7

When increasing drowsiness or lack of response is noted in an infant after any stress or accident (in infants a latent period is not the rule) or if localizing neurologic signs appear, intracranial bleeding must be presumed until it can be disproved. Causes of intracranial bleeding in infancy include birth trauma, erythroblastosis fetalis, prothrombin deficiency, and berry aneurysms. Later, hemangiomas found in the cerebellum and fourth ventricle, which result from defective differentiation of angioblasts from mesoderm, account for some active bleeding and neurologic symptoms requiring surgical intervention. Murphy[7] says that 10 per cent of cerebrovascular accidents in infants and children are embolic, the emboli coming from the heart, or as air, fat, or even amniotic fluid, and reaching the brain through the "back road" of the spinal complex of veins.

Spontaneous subarachnoid hemorrhage usually occurs at birth or in old age because of rupture of an aneurysm of the internal carotid or middle cerebral arteries. The outstanding feature is the dramatic and overwhelming onset of agonizing pain in the head which, unless the bleeding is massive and intraventricular, does not cause lasting coma. Treatment is nonsurgical and nonmanipulative if certain conditions are known to exist: (1) if the bleeding is not coming from a vascular anomaly, (2) if an aneurysm cannot be seen in an angiogram, (3) if the sac is seen by angiogram to stem from an irrigating vessel which would be classified as indispensable (in my experience all vessels in the neonatal infant are indispensable, but in adults over 50 years of age I do not hesitate to ligate completely the entire common carotid artery if

Fig. 8

Fig. 9

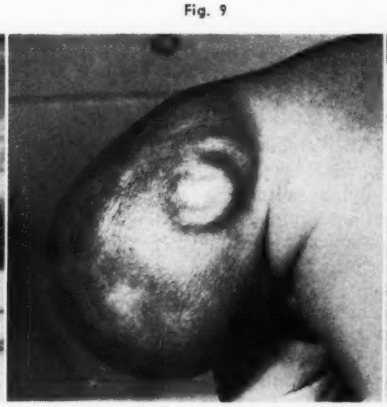

Fig. 10

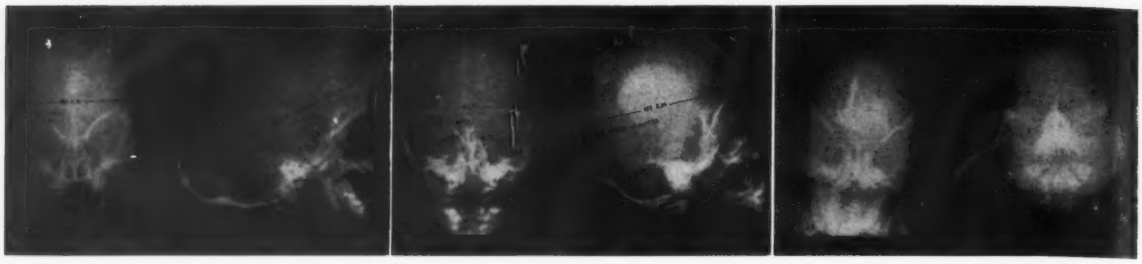

Fig. 11 Fig. 12 Fig. 13

bleeding cannot be otherwise controlled, and there has been a minimum of residuals), (4) the presence of bilateral aneurysms, (5) proof (by contralateral carotid compression) that collateral circulation is inadequate, and (6) the presence of few or no symptoms.

Developmental defects

Frequent developmental defects, which are all the more arresting because they are obvious, are meningocele and encephalocele and their variations—pedunculated, sessile, and those containing fluid only, or nerve fibers, or more substantial elements of spinal cord or brain.

Klemme[8] says that spina bifida is a congenital, anatomic, faulty developmental accident in no way related to heredity, diseased progenitors, or family conditions. In my opinion, Burns[9] has presented evidence (offspring of pregnant laboratory animals with lumbosacral lesions were found to have more developmental anomalies than the control animals) to modify Klemme's dictum. Ingraham and his associates[10] are of the opinion that 25 per cent of all children would show some minor defect of the vertebral spine or lamina upon x-ray.

In the neurologic services of the College of Osteopathic Physicians and Surgeons and of the Los Angeles County Osteopathic Hospital, the following generally accepted criteria are used in selecting cases amenable to surgical repair and rehabilitation: If hydrocephalus and paraplegia are absent and there is no gross loss of sphincter function, the defect is repaired. Sometimes the most hideous anomalies offer the best prognosis for no neural elements are contained in the sac. However, these grotesque forms should arouse suspicion of craniolacunia *(lückenschädel),* in which not only the bones are affected, but usually there is also congenital hydrocephalus.

Figures, 8, 9, and 10 show deformities which might be meningocele or encephalocele; one is a huge dermoid of the scalp, one is a huge sacrococcygeal teratoma, and one is a true lumbar meningocele. After some discussion and in spite of the removal of 60 cc. of xanthochromic fluid, I decided to treat the sacrococcygeal deformity (Fig. 9) as a tumor instead of as a meningocele. Dr. J. Willoughby Howe collaborated in the surgical removal of this teratoma. The tumor was attached to the tip of the coccyx by the slimmest fibrous stalk; there was no trace of meningeal or neural tissue and no connection whatsoever with the spinal sac.

In the differential diagnosis of such lesions, I employ transillumination in a dark room, meticulous neurologic examinations repeated as many times as necessary to confirm dysfunction, a search for other hidden anomalies, palpation, spinal puncture, air studies of the brain, and direct aspiration if conditions seem to warrant.

The antithesis of failure of the cranial sutures to close is craniosynostosis, characterized by too rapid closure of the fontanel and of one or all of the cranial sutures. Premature sagittal closure creates the scaphoid dolichocephalic head seen in Fig. 11. Premature coronal suture closure gives the wide flat brachycephalic appearance in Figure 12. Restriction in all the sutures except the fontanel results in turrecephaly or oxycephaly (Fig. 13).

If molding persists in the neonatal period, the head should always be x-rayed. If craniostenosis has occurred, craniectomy should be performed parallel to the involved suture. If all the sutures are involved, the operation should be done in two stages, 1 week apart. Operative intervention should be accomplished in the first year because mental retardation tends to occur thereafter because of brain restriction.

Conclusion

Various cranial disorders of the neonatal period which require neurosurgical intervention have been discussed and illustrated. The success of pregnancy is the normal infant. When, because of birth injuries or devèlopmental defects, the newborn suffers cranial defects, it is imperative that the physician be able to recognize the disorder and institute treatment, if the latter is feasible.

649 S. Olive St.

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Editorials

The profession midyear

On February 16, 1957, the osteopathic profession, organizationally, became 59 years of age. One way by which its members could have become fully acquainted with its growth, development, and status would have been to attend the midyear meetings of the agencies of the American Osteopathic Association, especially the sessions of the Board of Trustees. Since such an attendance was impossible, a brief review of the more important happenings at various midyear meetings within a 2-month period will furnish a substitute acquaintance with the profession's advance.

The Board met from 9 a.m., December 9, until noon of December 11, not excluding Sunday. The meeting days, never beginning later than 9, usually continued until 7 p.m., with an hour for luncheon. Adjournment at 7 meant no more than an hour for dinner, after which members returned to Central Office to serve on one of a series of reference committees. These committees were set up to study matters which had been brought during the day to the attention of the whole Board. Furnished with mimeographed copies of pertinent material, they had to resolve problems and bring advice and recommendations to the Board for its action. These procedures follow the common pattern of all large bodies with extensive agenda.

Multi-responsibility

At the national level, the American Osteopathic Association now has a near-million-dollar yearly budget. Its business includes being an approving and accrediting agency for six professional schools; a medium for accreditation of postgraduate training; an evaluating and certifying body for medical specialties; an investigative and granting agency for fundamental and clinical research projects; a minimum-standard-making, inspecting, approving, and registering body concerned with about 400 hospitals; and a publisher of three official magazines and a yearbook. As do all bodies bearing a responsibility for public welfare, the organized osteopathic profession must provide for keeping its own house clean by maintaining and enforcing high ethical standards within its membership; on the other hand it must protect its doctors from the chicanery of unscrupulous elements that emerge from the general public. These responsibilities are a charge respectively upon the Committee on Ethics and Censorship and the Committee on Professional Liability Insurance.

One of three departments of the American Osteopathic Association is that of Public Relations which maintains a Washington office and has no less a job than making the resources of the profession, its members, and its institutions available to the President of the United States, the Advisory Committee to the Council on National Defense, and the Surgeons General of the Navy, the Army, and the U. S. Public Health Service. The increasing determination of the Congress that the Nation's health needs shall be met makes it imperative that the lines of communication between the Government and the osteopathic profession be kept clear. Twice yearly the Chairman of the Department of Public Relations, through a carefully detailed report, acquaints the Board with medical advance as it relates to the nation's needs and the profession's obligations thereto.

Congress' growing recognition that the financial problems of medical schools are restrictive of medical education is a recent and most important development. Medical education generally has necessarily become a concern of Government and in part may well become a charge upon it. Its significance to the osteopathic profession lies in the fact that Congress itself clearly identifies the two healing art professions in the United States that provide a complete health service to its people. The Government of the United States acknowledges the fact that Physicians and Surgeons, D.O., make an essential contribution to the health needs of the nation through their medical care of its people. The responsibilities of our profession can be clearly seen only in relation to the total health need and supply picture in the United States. For that reason the semiannual report of the Chairman of the Department of Public Relations and the monthly reports of the

Washington office are of profession-wide interest. The Chairman's 1956 midyear report emphasized especially the Administration's concern over the financial problem of all medical schools.

Nomenclature

A total picture of the profession midyear, however, cannot be obtained unless some reporting is made of related meetings held before and after Board sessions. The Committee on Standard Nomenclature met early in November. It is engaged in reviewing and revising osteopathic nomenclature, to the end that structural findings, especially, can be described in a terminology acceptable to scientific literature. Such classification would replace official osteopathic nomenclature presumably in use since 1933 and supplement terms in the "Standard Nomenclature of Diseases and Operations." The new glossary is planned to be particularly descriptive of those disturbances in the body framework that appear to be largely functional in nature, the description of which is inadequate throughout the field of medical science. Lists of terms were reported in 1907 (Hardin) and in 1915 (Forbes).

Development of a truly scientifically descriptive nomenclature will be of great value for coding purposes, especially as related to office and hospital case records. The Chairman of the Committee on Standard Nomenclature, Dr. W. Fraser Strachan, pointed out, however, that the development of a glossary consistent with terms acceptable to all biologic and health fields demands time and wide consultation. The Committee is being requested to include in its study a review of the terms by which the profession attempts to identify itself to the public—enlarging its area of investigation to examine the terms used in the publications of the American Osteopathic Association, including those that were defined in the November 1956 FORUM, under the editorial heading, "Define Your Terms." Reports on the Committee's progress will be made from time to time in the publications.

Second seminar and clinical study

Another important pre-Board meeting was a second "Seminar on Teaching of Osteopathic Principles and Technics." Again, as in the first Seminar held a year previously in Des Moines, representatives and guests were present from all the osteopathic colleges and from the Bureau of Professional Education and Colleges, the Bureau of Hospitals, and the Editorial Department of the A.O.A. The Seminar has become a consultative study group concerned with reorienting our professional education as it is related to osteopathic principles and therapeutic technics. A third Seminar is planned, with Board approval, for 1958.

A third important November meeting was that of the Committee on Clinical Study, of which Dr. George W. Northup is Chairman. The work of this Committee, first called to the attention of JOURNAL readers 2 years ago, involves increasingly broad responsibilities. One is to integrate the science and art of osteopathy into the study, evaluation, and therapeutic management of case problems; a second, to re-examine and classify existent osteopathic literature; and a third, to accumulate acceptable data on the clinical management of case problems. A cumulative index had never been made of the fifty-five completed volumes of THE JOURNAL. Now indexing is in process and probably will be published in book form. Plans are being made to keep the index up to date.

The Committee is interested in a project that would search medical and allied scientific literature for reports on disturbances in the body framework which appear to be associated with dysfunction of remote tissues, leading not only to functional changes but to organic as well. Such disturbances have more commonly been described in osteopathic literature. A review and appraisal of the mass of osteopathic literature now under way will be continued. The program of the Committee on Clinical Study, only sketched here, is growing in significance to the profession.

Professional education

Preparatory to the meeting of the Board, the Bureau of Professional Education and Colleges held a 2-day meeting. The responsibilities of this one of the nine agencies of the Department of Professional Affairs cover the most important and far-reaching activity of the Association—that of professional education. The Bureau, subject to Board approval, formulates the educational policies of the profession; it inspects and approves its colleges; studies and evaluates specialty training programs leading to certification; and assists in the accreditation of graduate education. Its midyear meeting is primarily devoted to solving problems that have arisen during the previous 6 months and reporting its findings to the A.O.A. Board for recommended action. Among seventeen specific recommendations, the Board approved the American Osteopathic Academy of Occupational Medicine as an affiliate of the A.O.A., it accepted a number of changes in the constitution and bylaws of the American College of Osteopathic Internists, and granted name changes to the American Osteopathic College of Dermatology and Syphilology and the American Osteopathic Board of Dermatology and Syphilology. Each was allowed to drops the words "and Syphilology" from its name.

Other pre-Board midyear meetings included that of the Associated Colleges. Representatives were deeply concerned with physical plants, faculties, clinical facilities, research, and mounting budgets.

National Auxiliary

The Executive Board of the Auxiliary to the American Osteopathic Association met for 2 days in December. This group, the governing body of the Auxiliary, reviewed the progress of its broad program, geared to aid the profession in meeting the Nation's health needs. Special consideration was given to the Auxiliary's promotion of HEALTH as a medium of education and information to lay people, to its student scholarship effort, and to the expansion of the guild program for osteopathic hospitals. Doctors unacquainted with the serious role of the Auxiliary should glance over its department in the FORUM each

month and review occasionally the well-edited and attractive quarterly, *The AAOA Record*.

Board report and sessions

The pattern for A.O.A. Board sessions, both annual and midyear, is well established and routine to so experienced a body. But the sessions are never routine. They are a continuing audit, covering both 6-months' accomplishment and the consideration of blueprints for 6 months ahead. In December Dr. True B. Eveleth made his first report as the Association's Executive Secretary. He referred to memberships as increasing yearly by about 250, with an attrition rate of a little more than 175. The net gain in membership is necessarily small for our six Colleges can graduate only a limited number of doctors. In addition, the annual output of new doctors is not reaching the maximum, owing to the general situation relating to the professions, nation-wide. Osteopathic colleges, as do medical schools, find themselves in a competitive market for students, not with themselves or other medical schools, but with industry and business. The high cost of medical and postgraduate education—inclusively—and the long time involved in training a physician, are deflecting more and more students from the professions of osteopathy and medicine.

The Secretary's midyear report took note of a number of significant personnel changes. Mr. David Darland returned to his own profession of education and an important position with the Oregon Educational Association—accompanied by the warm appreciation of the profession for his 3-year contribution toward a wider understanding of the osteopathic profession in all fields. His assistant, Mr. Robert Klobnak, has been named Director of the Division of Public and Professional Service. Dr. Clyde Henry is the Association's first Director of Hospital Inspections, and Mr. G. Willard King, on January 15, became the new Director of the Osteopathic Progress Fund, succeeding Mr. Lewis Chapman, now executive secretary of the Alumni Association of the Kirksville College of Osteopathy and Surgery. Our readers know that O.P.F.'s achievement over its 9 years of existence and its status today stand as a tribute to Lew Chapman.

The Secretary's report pointed to greatly increased interest and activity in 1957 by divisional societies and the lay friends of the profession in more than forty states, all to one intent—to secure for the public of these states fuller participation by osteopathic physicians in meeting health needs.

Dr. Eveleth strongly emphasized the importance of participation by doctors of osteopathy in the work of the National Health Council and its fifty-three affiliated bodies. An active A.O.A. membership in N.H.C. has been developed at the national level through attendance by our delegates at the Council meetings and at the Annual Forum. A.O.A. publications are emphasizing what the National Health Council does and is. However, all this is of little worth to the N.H.C. program if the profession locally does nothing to assist in community health planning. In many communities, what is actually needed is the leadership that is too often missing from both osteopathic and medical groups. Secretary Eveleth suggests that the new N.H.C. slogan—"together for health"—should be made the profession's slogan in every section of the country.

The A.O.A. has received inquiries concerning activation of the Public Law commissions for doctors of osteopathy in the Medical Corps of the Armed Services. The Executive Secretary suggested that the permissive aspects of the Law should not be thought of as a method of evasion of its provisions. Actually, commissions for D.O.'s cannot be made available until the Services amend their respective regulations in consonance with the implementary regulations prescribed by the Secretary of Defense on October 24, 1956. This will take additional months.

Affiliation

Among other matters, Dr. Eveleth stressed the fact that not only are there a number of bodies affiliated with the American Osteopathic Association but that the number seeking affiliation grows from year to year. He pointed to the need, therefore, for provisions to be written into the records as to what constitutes an affiliate, and what standards must be met by organizations seeking affiliation. In compliance with the Secretary's request for further directives on affiliate status, the Board ordered the following provision on affiliates be added to those already found in the Manual:

> Any organized group desiring affiliation with the A.O.A., or any organized group desiring affiliation with an affiliate of the A.O.A., shall submit a copy of its constitution and bylaws for approval by the Board of Trustees of the A.O.A. If such approval is granted, the group will be listed among the affiliated organizations in the DIRECTORY of the Association and in other official rosters, and the group may designate on its letterhead its affiliate status.
>
> Any amendments to the constitution and bylaws of such an affiliate shall also be submitted to the Board of Trustees of the A.O.A. for approval and until such proposed amendments are given formal approval, the affiliate shall continue to operate under its previously approved constitution and bylaws.

Finance and business

The Treasurer reported in detail on the financial structure of the Association; this report is always given the most careful study by the Committee on Finance as the basis for its submission of the budget to the Board for its final approval. The A.O.A. fiscal year is from June 1 to May 31, and the budget is actually planned in July for the new fiscal year, but it is re-examined at the midyear in relation to both income and expense. The Committee on Finance has had the entire financial operations of the Association under study since July 1956, with a view to long-range planning for budgetary needs. The financial structure of the Association is sound, the 1956-1957 budget is in the black, and the services of the Association will not be curtailed during that period. Trimming of the requests of the Association's various agencies is at its maximum, however, and attempts at keeping the budget balanced in the face of the profession's increasing needs for service will eventually result in cut-backs.

An association can be a business, and the American Osteopathic Association from that aspect has moved

into bigger business groups. Necessarily, the A.O.A. business headquarters is at the Central Office. The Association's administrative executive is its Executive Secretary, the chief official having direct oversight of its salaried staff. But oversight is not management, and the business of the Association has grown to such volume as to require management by a person trained in the modern technics of management, highly skilled, experienced, and with a gift for organizing detail.

More than 2 years ago the A.O.A. Board of Trustees recognized that the Association had outgrown its headquarters staff structure and that its salaried officials and their assistants were handicapped by the long-established patterns and traditions within which they were expected to work. The Board's first move, therefore, was to call in research consultants from different fields to examine the A.O.A. staff structure. Experts in three fields of association administration and management have completed their assignments, and many changes have already been instituted leading to greater efficiency and production. Other changes are in process; still others are being studied. Some of these changes were indicated in the report of the new Business Manager, Mr. Walter A. Suberg.

One of the important responsibilities of the Business Manager is that he is the business, advertising, and circulation manager of all A.O.A. official publications. Publication costs are continually mounting, but in the face of that fact, Mr. Suberg was able to report a substantial reduction in THE JOURNAL budget for the latter half of the 1956-1957 fiscal year. He reported that he was beginning a study of the printing costs of THE FORUM and HEALTH, with a view to their possible reduction.

Other changes bringing Central Office structure in line with the recommendation of the Association's surveys were reported—these changes include a centralized purchasing system, a perpetual inventory-control system, with responsibility and authority fully centered in the Business Office. A personnel program has been developed which includes job classification and a minimum and maximum wage schedule. Once a program is working, its operation in any well-supervised group becomes automatic to a degree. When this has been accomplished, it will free Mr. Suberg to devote more time to the promotion of our official publications and the solicitation of advertising than in his early months of tenure.

Many matters

Only a few of the many activities reviewed by the A.O.A Board can be mentioned here. The Chairman of the Bureau of Hospitals, Dr. Vincent P. Carroll, presented a six-page study of his Bureau's work with osteopathic hospitals since the July 1956 report. Many of the problems that have plagued the Bureau and the profession for the past 5 years are reaching a solution. The widening solution of these problems, due in part to the increased experience and maturity of the Bureau itself, is making for much smoother professional relations with local, state, and governmental agencies. This is resulting in better patient care and good hospital practices.

A routine matter not handled routinely was the approval of hospitals recommended for intern and/or resident training approval, to become effective July 1, 1957. The list currently published, which covers the period up to June 30, 1957, will be found in the January 1957 JOURNAL, and in the 1957 YEARBOOK AND DIRECTORY, which will come off the press in March. Dr. Carroll made a special presentation of the new inspection program, emphasizing the Bureau's determination in 1957 to carry it out effectively and satisfactorily and to give increased service to the profession and its institutions.

Special attention should be given to the reporting of the Office of Education, Lawrence W. Mills, Director. This can best be done by reviewing the Educational Supplement which is a part of the January 1957 JOURNAL. The material there gives in detail information submitted to the A.O.A. Board by Mr. Mills in December 1956. The Supplement is an authoritative document presenting facts that should be known by all doctors of osteopathy interested in their profession's progress in its most responsible field—the professional education of physicians.

Post-Board

Post-Board meetings included a session of the Executive Board of the Academy of Applied Osteopathy, meeting January 26 to 28; a meeting of the House-Board Committee on the Study of A.O.A. Organization and Development, January 26; the annual meeting of the Association of Divisional Society Secretaries on February 9-10; and a luncheon meeting of the Bureau of Public Education on Health on February 11. This last meeting was scheduled at this time since some of the Bureau's members attend the Annual Congress on Medical Education and Licensure.

Retrospect reveals pattern

The midyear meetings of the A.O.A. Board and its related groups mark the osteopathic midyear—the fiscal year and the organizational year that terminates with the inauguration of a new A.O.A. president. The July and December Board meetings actually cross administrations, but still constitute a unit reflecting the commitments and concerns of the profession. The human obligation of the osteopathic movement today emerges clean-cut from these meetings—it is to furnish society with physicians and surgeons in no way divorced from the fundamental facts of a special body of man's knowledge—medicine.

The House of Delegates of the American Osteopathic Association more than 4 years ago authorized publication of the statement that the first objective of the osteopathic profession was "to make available to the public the best health care." In development of that statement, the House reaffirmed "its policy of maintaining a separate, complete and distinctive school of medicine."

Employed out of context and deprived of the historical background from which they emerge, such words as separateness, completeness, distinctiveness, and independence represent anachronistic thinking

characteristic of nineteenth century medicine. In today's human situation, these words are not applicable to healing arts groups which are instigators and conservators of medical knowledge and ministers to a nation's health needs. A study of A.O.A. House and Board action of the past 5 years—nay, a basic analysis of the profession's 59-year-old history seen as medical movement—reveals a sense of separateness applicable only to healing arts agencies as private organizations, politically and economically motivated and sponsored. Specifically, the leaders of the profession are aware of its obligation to society, to the degree that its education dare not be separate from the main stream of scientific biologic knowledge, and they have no intent to attempt to isolate it. Every A.O.A. organizational move is made in the full realization that the profession is obligated to work more fully with representatives of all the disciplines in health and allied fields and of the general public.

The story of the osteopathic year 1956-1957 as it unfolds organizationally is that of a profession mature enough in its strength to face its weaknesses honestly. The osteopathic movement in medicine knows nothing of separateness or independence in the philosophy, science, and technology of medicine. It refuses to recognize the dominion and power that grow out of private agencies, and that seek to set up fences around medical knowledge, preventing its dissemination to those who have proved their right to use it. The lesson of the times is that total control by any private group or the state—political and economic control—is dangerous. On the other hand, the kind of separateness and independence healthwise that is represented by some seventy national bodies working together in the National Health Council is a most salutory thing. Every organizational action of the A.O.A. during the past year has been motivated by its sense of its need to work together with its peers in the search for "better health for Americans."

At the midyear 1956-57, the profession of osteopathy rests its case upon its professional standards, its organizational willingness to cooperate with all authentic individuals and agencies, and the competence of its doctors to meet the health needs of the people.

Notes and COMMENTS

Surgical procedures—an important manual

A NEW 58-PAGE manual entitled "Surgical Procedures; Classification and Nomenclature," functionally designed and beautifully printed, has been prepared by the Health Insurance Council, Room 800, 488 Madison Avenue, New York 22, N.Y., for free distribution to doctors and hospitals. An authentic document, it adapts the Standard Nomenclature of Diseases and Operations for the use of the physician or his secretary in completing claim forms simply and quickly. The nomenclature covers some 1,000 procedures into which practically all surgical operations may be classified. Medical personnel may obtain copies by writing on professional stationery to the above address.

Aldosterone and body fluid and salt balance

THE DISCOVERY in 1952 of the adrenal hormone, aldosterone, was a first step in understanding how the fluid and salt balance in the body is normally regulated. If the mechanism of that balance was understood more completely, medicine would better understand the cause of the edema that develops in heart, kidney, and liver disease. It has been established that an excess of aldosterone is involved in edemas by virtue of the fact that it is the body's primary salt-retaining hormone and is known to cause sodium retention. Clinicians have long known that sodium retention by the kidneys, whether due primarily to heart disease or more directly to a chronic renal insufficiency, may lead to fluid retention and make a low-sodium diet mandatory.

For the past 4 years scientists at the National Heart Institute have been working to discover the role of aldosterone in normal homeostasis as well as the part it plays in certain disease states.

Effective medical control of fluid and salt metabolism apparently had to await more complete knowledge of the mechanism which regulates the production of aldosterone. A recent release from the National Institutes of Health, however, points to another approach to the problem of the regulatory mechanism which underlies changes in body fluid volume. This different approach reveals evidence that changes in the extracellular fluid volume appear to be controlling factors in aldosterone secretion, a factor independent of total body sodium or sodium concentration. Studies made at the Heart Institute showed that the body fluids of salt-depleted human subjects could be expanded by administration of water *without* the addition of salt. These and other studies made at the Institute suggest that aldosterone secretion is independent of circulating sodium and that it is probably responsive to volume changes somewhere in the circulatory system. Thereby, extracellular fluid volume seems to be a controlling factor in aldosterone secretion.

To the practicing physician this newer knowledge

may appear to offer no help in his attempts to control body fluid and salt balance effectively and, therefore, is of no significance to him. Actually, these studies point the way to questions of practical clinical importance and are another step toward the necessary understanding of the normal regulation of fluid and sodium balance. Among the questions emerging from the research —questions that involve further research—the Institute's scientists suggest these: Exactly what part of the extracellular space is critical for aldosterone regulation, and how are the stimuli from this hypothetical "control center" mediated to the adrenal cortex? Is a volume defect responsible for the edema of heart disease, or is some other unknown defect, not related to volume, responsible for the edema of disease states? These are questions of practical clinical importance which can only be answered by further research.

Out of these answers as yet unavailable may well come an understanding of the causes of edema in heart, kidney, and liver disease.

Untimely death of Dr. Kinsey

THE UNTIMELY DEATH of Dr. Alfred C. Kinsey, an associate of the Staff of the Institute for Sex Research, Indiana University, will be noted with regret by thoughtful people. The time is not yet here when the value of his contribution to the problems of sexual behavior in the human male and female can be estimated. Without doubt, however, he has cleared the way for a much more meaningful study by others than could have been undertaken had he and his associates not first blazed a trail through a field totally obstructed by taboo, moral precepts, individual and group training, and long-established behavior patterns. Henceforth, the way will be easier for the psychiatrist, the psychologist, and the sociologist, as well as for other men and women who would lead their fellows in a continuing search for the good life.

Notes in briefer form

THE WORK ON AN EXPERIMENTAL live virus poliomyelitis vaccine as developed by Dr. Albert B. Sabin, Cincinnati, Ohio, has reached the stage where it can be taken orally to successfully immunize chimpanzees. Its next test will be through trials on prison volunteers. Authorities are agreed, however, that Salk vaccinations should be pushed to complete the full course of three inoculations before the next polio season. Oral vaccine for human beings may be far distant. . . . The American Cancer Society has announced that it will spend a record of $8 million in 1957 for research. Government funds allocated to the National Cancer Institute will involve an additional $20 million —to be used in a search for chemicals to cure or check cancer. The Society calls attention to the fact that 20 million living Americans are now marked for death by cancer, to which we lose a quarter of a million men, women and children each year.

Case Reports

Acute fulminating alveolar cell carcinoma of the lung

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ON JANUARY 2, 1956, a 47-year-old white male patient presented himself with the complaint of pain of 3 week's duration in his right shoulder and neck. Previous chiropractic treatments, approximately six in number, had given him little or no relief. There was no history of trauma to his shoulder. Shortly thereafter, the patient developed diplopia in the right eye, after which he was instructed to discontinue chiropractic treatments.

A carefully taken history disclosed that the patient had lost 7 pounds in the past month, he had had a chronic nonproductive cough which he attributed to cigarette smoking (he smoked 1 to 2 packs per day), and he had had night sweats for approximately 2 to 3 years. The patient had been dyspneic for the past 2 to 3 months. There was a family history of tuberculosis. The patient had had pneumonia 30 years before and had had the usual childhood diseases. There were no indications of any allergies.

Physical examination

The patient, an asthenic white male, weighed 136 pounds and was 5 feet 5 inches tall. His temperature was 98.6 F., the radial pulse was 120 per minute, respiration 16 to 18 per minute, and blood pressure was 130/78. The skin and mucous membranes were normal. Cerumen was present in both external auditory canals. Horner's syndrome was noted in the right

eye, the right pupil being dilated. The patient had upper dentures, and pus exuded from the lower gum margins. No polyps or nasal septal deviation was noted. General observation disclosed clubbing of the phalanges of both upper and lower extremities. The patellar, Achilles tendon, biceps, triceps, and abdominal reflexes were hyperirritable. The Babinski reflex was normal.

Palpation disclosed a hard mass, not freely movable, in the right supraclavicular area. It was seemingly bound to the underlying tissues, was about the size of a walnut, and of a very hard consistency. Findings were normal upon palpation and percussion of the abdomen, except for slight tenderness in the epigastrium on deep palpation. Rectal digital examination revealed no masses, and the prostate was of firm consistency with no nodularity.

X-rays of the chest and cervicodorsal area showed extreme arthrosis of the lower cervical and upper dorsal regions of the spine. The superior mediastinum was widened to the right. A faint nodular infiltration of both lower lung fields was suggestive of metastatic carcinoma of the lungs.

At this time, a provisional diagnosis of metastatic carcinoma of the lungs, possible mediastinal tumor, and/or aberrant thyroid carcinoma was made.

Diagnostic studies

The patient was hospitalized at Grandview Hospital for further diagnostic studies on January 1, 1956. Medical, ophthalmologic, and surgical consultants were called to evaluate the case. Inequality of pupillary size, mild hyperemia of the left optic disk, diplopia, and limitation of ocular movements pointed toward a diagnosis of paralysis of the oculomotor secondary to metastatic cancer.

Medical consultants again pointed out the palpable lymph nodes in the right supraclavicular fossa. Just medial to these in the area of the thyroid was a small palpable mass which could be the right lobe of the thyroid. The apical pulse rate was found to be consistently high, approximately 118 per minute. Electrocardiography revealed sinus tachycardia with a suggestion of myocardial ischemia. Neurologic findings were normal except for hyperirritability of the reflexes and a slight tremor of the tongue and hands. Marked clubbing of the fingers and toes suggested pulmonary osteoarthropathy.

Biopsy of the supraclavicular nodes was disappointing, one node showing caseation necrosis and the other lymphadenitis. However, it was thought at the time that the necrotic material may have been degenerative products of cancer. Recheck x-rays of the chest again revealed the round opacities indicative of neoplastic disease. Serial x-rays were negative, and no metastasis to pelvis or lumbar spine was noted. Roentgen studies of the upper gastrointestinal tract, colon, urinary tract, and skull were also negative.

Following are the laboratory findings:

Blood: Erythrocytes 4,050,000 per cu. mm.; leukocytes 12,450 per cu. mm. with 77 per cent segmented cells and 23 per cent lymphocytes; hemoglobin 77.9 per cent, 12.05 grams per 100 cc.; corrected sedimentation rate 30 mm. in 1 hour; hematocrit determination 40 per cent packed erythrocytes per 100 cc.; protein 7.84 grams per 100 cc., albumin 3.86 grams and globulin 3.98 grams.

Cerebrospinal fluid: Queckenstedt's sign was present, indicating normal spinal fluid pressure; there were 1 lymphocyte and 1 polymorphonuclear leukocyte per cu. mm.; protein was 37 mg. per 100 cc.; no globulin was present; and sugar and chloride levels were normal.

Hepatic findings were normal; total cholesterol was 190 mg. and cholesterol esters 135 mg. The basal metabolic rate was plus 44.

Course

The patient appeared to improve during his hospital stay, the pain in his shoulder being completely relieved. He began to eat better, and the congestion in his chest completely disappeared. This was attributable to the antibiotic therapy. He was dismissed from the hospital on January 15 with the recommendation that further thyroid studies be made, namely protein-bound iodine and radioactive iodine uptake tests. It was decided to wait at least 3 weeks, since the iodine preparations which had been used for urography might affect the accuracy of the uptake studies. There was at this time no conclusive evidence of the primary site of the cancer.

Upon returning home, the patient's condition began to regress. He was readmitted to the hospital and, because of thyrotoxic symptoms—elevated basal metabolic rate, persistent tachycardia, and a suspicious node in the right lobe of the thyroid, subtotal thyroidectomy was performed. The pathologic report revealed no evidence of cancer of the thyroid. Postoperative recovery was uneventful, and the patient was dismissed from the hospital.

On February 27, 1956, planigraphy of the chest was performed, and a mass was revealed in the right hilus which encroached on the primary bronchus to the upper lobe. There was extension of the solid infiltration into the periphery of the lung from the hilus in the region of the basilar limits. At this time it was felt that the primary lesion could be arising from a small bronchial trunk, with metastasis to the hilar zone. However, after consultation with the Pathology Department, it was decided that this might be a case of primary alveolar cell carcinoma of the lung.

Within a 2-week period, the patient's condition again showed marked regression, and at this time cerebral manifestations were noted—difficulty in gait (walking on a wide base and stumbling), incoherence, difficulty in swallowing, intermittent periods of coma, and urinary and bowel incontinence. For financial reasons the patient's family desired to have him admitted to a veterans hospital, and on March 15 the patient was admitted to Brown General Hospital.

Upon admission his general appearance and nutritional state were fair. He had the capacity to answer only simple questions. His physical condition was essentially unchanged except that the fundi of the eyes now showed grade I papilledema. The spinal fluid was initially reported to be xanthochromic but was later found to be clear. There were 26 erythrocytes, 1 polymorphonuclear leukocyte, and 8 lymphocytes per cu. mm. of fluid, globulin was 2 plus, and total proteins were 74 mg. per 100 cc. Cranial x-rays showed some widening of the right lambdoid and temporal sutures.

Tissue removed from the right supraclavicular node for biopsy showed undifferentiated adenocarcinoma. The impression at this time was that the primary lesion was in the lung with metastasis to the cerebrum. Electroencephalography showed diffuse random slowing, largely bisynchronous, suggestive of paroxysmal cerebral dysrhythmia. The findings were consistent with those of a lesion of the posterior fossa.

From the beginning of April, the patient was completely unconscious except for occasional periods of awakening. He was maintained on intravenous fluids and occasionally received transfusions of whole blood. Periodic edema of the face, neck, and upper extremities had occurred since that time. Obstruction of the superior vena cava was evident. There were periodic elevations of temperature, occasionally spiking to 102 F. From time to time the urine had been blood tinged. During the last week of hospitalization, there were brief episodes of Cheyne-Stokes respirations and profuse diaphoresis. The patient died on May 7.

Autopsy findings

Autopsy was performed shortly after death and the following were noted: Metastatic spread of the cancer was found in the pericardium, lymph nodes, kidneys, and adrenal glands. In addition to the cancer metastases, there were multiple abscesses in the right upper and middle lobes of the lungs. Cerebral edema was most marked on gross examination, the gyri and sulci showing little differentiation. Internal hydrocephalus was moderately severe. The pleurae, pericardium, and epicardium were studded with cancerous nodules. The superior vena cava was patent, but the lumen was markedly decreased in diameter. The peripancreatic lymph nodes were also involved with tumorous nodules. The liver was moderately congested, and beneath the capsule were two small nodules, the only areas of the liver showing possible, although questionable, metastatic involvement. The retroperitoneal and periaortic lymph nodes were also involved by the cancer. There were tumor masses in the tail of the left caudate nucleus and in the left cerebral and cerebellar peduncles.

This tumor apparently was a primary carcinoma of the lung, multicentric in origin with no one tumor mass larger than another. It apparently had its origin in the bronchioles and spread hematogenously and lymphogenously. This type of carcinoma is a variant of the bronchiolar or alveolar cell carcinoma.

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Frenquel: Report of a case of intentional overdosage with recovery

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EARLY IN 1955, A NEW compound, Meratran, with the peculiar ability to reverse the toxic psychosis experimentally with lysergic acid dicthylamide LSD-25 was reported by Fabing.[1] Later, Fabing and Hawkins[2] studied Frenquel (azacyclonol hydrochloride, which chemically is alpha-(4-piperidyl) benzhydrol hydrochloride), a bitter white crystalline substance, the gamma isomer of Meratran, and the first of its congeners to be investigated clinically. Although the only difference in the two compounds is that the NH radical is moved from the 2-position to the 4-position in the piperidyl ring, this difference results in a complete change in the pharmacologic action of the parent compound. Instead of being a central nervous system stimulant, as is Meratran, in the mouse Frenquel proved to be an antagonist of cerebral stimulants and of extremely low toxicity. Subsequent studies concurred in these findings.[3,4]

In clinical practice, Fabing and Hawkins[2] found that Frenquel was usually effective in the symptomatic control of various toxic psychoses and occasionally helpful in endogenous psychoses characterized by hallucinations and delusions. His dosage for oral maintenance varied from 15 mg. to 400 mg. daily; and for initial therapy, especially in toxic psychoses associated with the postoperative period, he recommended 100 mg. given intravenously. Subsequently, other investigators confirmed his findings.[5,6] The compound is available commercially in 20 cc. single-dose ampules designed for intravenous administration and as 20 mg. tablets designed to be administered in doses of one tablet three times daily.

The present report is of a young woman who took an intentional overdose of sixty of the 20 mg. tablets (sixty times the recommended single dose, twenty times the recommended daily oral dose).

Case report

A female patient, 30 years of age, was brought to me by her worried mother on January 6, 1956, with the chief complaint of hearing "voices" talking to her when no one was in the immediate vicinity. The night previous to her initial visit she had attempted, with very little success, to cut her throat; she presented a shallow laceration almost from ear to ear across the anterior surface of the lower throat.

Three years before, she had walked down a boulevard in Hollywood entirely nude. Subsequently, she received a lengthy course of electric shock treatments and psychotherapy as an inpatient in a mental sanatorium.

The physical examination was entirely negative, except for a cardiac rate of 140 and a leukocyte count of 16,200 per cu. mm. My impression was that the patient was schizophrenic with paranoid tendencies.

I tried to induce her mother at that time to have her readmitted to the sanatorium or to take her back to her psychiatrist whose office was quite a distance from the home. As neither the patient nor her mother was willing to comply with either of these suggestions I wrote a prescription for sixty Frenquel tablets, with instructions to take one three times daily.

The patient had an amazing recovery from her hallucinatory phenomena within a few minutes after the second tablet was taken. In spite of their evident effect, the patient was "against taking pills" and ceased taking them a few weeks later. She of course relapsed and, seeming bent on self-destruction, swallowed a whole new supply (sixty 20 mg. tablets) of Frenquel. She had no emergency care but vomited several times. She seemed none the worse for her experience when I saw her the following day. I could not be sure whether the vomiting was self-induced or involuntary, even after inquiring closely into this aspect. As it is somewhat unusual for this type of a schizophrenic patient to have suicidal rather than homicidal tendencies, I concluded that the vomiting was at least partially self-induced.

The patient has since been taking Frenquel tablets

more regularly. She seems to have become more cooperative and has been able to remain away from electric shock therapy and institutional care. At present (7 months later), she is still taking 20 mg. of Frenquel three times daily and is nearly well enough rehabilitated to resume her occupation as a secretary.

Summary and conclusions

A 30-year old female patient swallowed a single dose of 1,200 mg. of Frenquel, presumably in a suicide attempt. This is sixty times the recommended single oral dose and twenty times the recommended daily dose. Recovery was complete without therapy, and following subsequent treatment with Frenquel (in the therapeutic dosage range) the symptoms of her mental illness, schizophrenia, have improved.

1005 N. Cordova Street

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Research Grants*

▶ The research program of the osteopathic profession continues to broaden in scope and importance. The program is receiving increasing grant support from sources within the profession, the public, the federal government, and others concerned with the public health. Grants-in-aid from the American Osteopathic Association made annually through its Bureau of Research have risen from $2,552.72 in 1939 to $84,065.00 in 1956.

The major theme of the osteopathic research program is the study of adaptive responses of man to his environment and related somatic-autonomic interchanges in his body systems. Practically all current research is basic because of urgent need for fundamental information necessary to a program of applied or clinical investigation.

Through research grants and other assistance, the American Osteopathic Association's Bureau of Research has helped osteopathic institutions and investigators so that they could qualify for assistance from other fund-granting agencies within and without the osteopathic profession.

This report sketches some issues which bear on the profession's research program and the availability of supporting grants.

PART I. RESEARCH UNDER OSTEOPATHIC AUSPICES

Categories of Osteopathic Research.—

Research in general is a form of activity with highly distinctive characteristics. While it is native in some degree to most individuals, it has become formalized in large measure into a professional practice under institutional administration. It has two distinct aims: (1) gathering of new knowledge from the unknown in the universe in which we live and (2) establishing dynamic interrelationships.

Scientific curiosity is purposeful, persistent, and intensive; it is aimed at human betterment. The scientist wishes to know more of the world in order to help make it better. However, the scientist searches because he likes to search. He likes to find answers to provocative questions.

Research is laborious, hard work which calls for intelligence, money, materials, and direction. Instruments must be devised and hands must be trained to perform new work as needs and newer knowledge unfold. It is motivated by several factors: (1) lure of adventure into the unknown, (2) curiosity, (3) need for answers to pressing problems, (4) awareness that knowledge is power that can be put to some practical use, and (5) realization that knowledge of the universe and its harmonic relations can provide intellectual and esthetic satisfactions as well as contribute to continuity of human existence.

Motives which lead to research vary with individuals and with conditions. Wide spans exist between "idle curiosity" that is satisfied with emotional thrills of superficial and incomplete knowledge and the critical disciplined pursuit of the scientist, between search for knowledge of fundamental principles and their application with market value.

Medical research—of which osteopathic research is an integral part—is the endeavor to gain more significant knowledge of: (1) health—its nature and maintenance and (2) disease—its cause, nature, prevention, and treatment.

As in other fields of scientific investigation, research in medical and related sciences, which includes work of investigators in the osteopathic profession's research program, falls into three major categories which overlap to some extent. These categories are: (1) basic and background research, (2) applied and developmental (clinical) research, and (3) teaching.

Basic research is the quest for fundamental knowledge about the nature of man and the world about him and the principles that govern them. The stream of discoveries coming from basic medical research feeds all medical science and technology.

Applied and developmental research directs basic discoveries toward definite objectives such as new concepts, inventions, and technics.

Teaching as a research activity includes the use of research methods and programs as educative technics for training new scientists. A well-balanced curriculum in medical sciences, in which education and research are interrelated,

*Presented by Dr. Levitt at the annual meeting of the American College of Osteopathic Internists, Kansas City, Missouri, October 5, 1956.

moves chronologically from study of the cell to organs, to organ systems, to the integrated whole human being, and to man in his environment. Such a curriculum intellectually feeds the scientist-teacher as he trains the student in disciplines of science and in the scientific attitude essential to the well-prepared physician.

Newer studies in medical and related sciences (and in this, osteopathic education and research take a major role) are directed toward man as a whole organism, his changing environment, and his inter-reactions with friendly or hostile factors in the environment expressed through his body systems in states of health or disease.

Modern scientific investigations in medical and related sciences often lead to revision or better understanding of older concepts and the addition of new and better methods in clinical practice. For example, one of the important concepts that has come out of modern medical research is that something hopeful and realistic can be done to help persons with chronic disease and disability; we no longer consider chronic ailments, including heart disease, hemiplegia from cerebrovascular accidents, diabetes, arthritis, cancer, and others, as inevitable concomitants of age changes in the individual.

Modern research shows rheumatic heart disease as a consequence of uncontrolled body infection with the streptococcus; lung cancer is linked with cigarette smoking, certain occupational exposures, and other hurtful environmental conditions; and anxiety states, faulty dietary habits, disorders in the body mechanism, and other daily experiences as intrinsic body factors which predispose the individual to hypertensive heart disease, diabetes, and many other common illnesses with long-term disability.

Modern studies show, also, that many disabled people, once neglected in hospital wards and custodial care, are being helped to substantial improvement and sometimes to a return to useful work, through technical devices, physical therapy, and other therapeutic means which have resulted from research activities.

Advances in medical knowledge that have come from modern scientific research have occurred with such rapidity that even the best preparation for practice (regardless of the school of medicine) soon becomes inadequate without continous revision of older concepts and addition of new information in medical education and clinical practice.

For this reason, there is need to be continuously aware of the interdependence of medical practice, medical education, and medical research.

Health needs of our rapidly growing population call for increasing research in medical and related biologic sciences. This requires:

1. A continuing and large supply of qualified persons for training in scientific research.
2. Adequate facilities essential for that training—facilities as personnel, plant, and equipment, and money with which to finance training programs and research activities.
3. Inspired, qualified leaders—both professional and lay persons—dedicated to the human welfare.
4. Establishment of horizons or objectives.

All these are essential to preventive medicine and improved health care—expressed realistically in the individual as sustained good health.

To accomplish this, we have great need for more scientists, and more well-qualified students interested in further training as preparation for careers in teaching and scientific investigations. The objectives and accomplishments of osteopathic research are influenced by these needs.

Earlier objectives of the osteopathic profession's research program were often considered as search for "proof of osteopathy" or its principles. With changing times, there was change in the direction and scope of osteopathic research—now more accurately termed "research under osteopathic auspices."

Present objectives of the profession's research program are:

. . . to create a constantly growing reservoir of basic knowledge regarding the human body and its frailties from which understanding may be derived and to provide a basis for the development of superior technics for the betterment of human health.[1]

In essence, the profession seeks scientific explanation of physiologic phenomena observed in the practice of clinical osteopathy. Through research, the profession seeks to gain new knowledge about basic causes of health and disease and, from this knowledge, to establish better technics for promotion of health, prevention and control of disease, and rehabilitation of disabled persons.

Aims of the profession's program include further development and correlation of research activities at osteopathic colleges and their teaching hospitals, developing more research workers from among qualified osteopathic graduates, encouraging research in general and specialty practices, and making available, for the use of the profession and other scientific groups concerned with public welfare, results of osteopathic research as fast as developed.

In regard to its over-all obligation to public health, the profession's basic and applied research and its output of research literature have not kept pace with clinical practice or needs. This situation is of considerable importance to the osteopathic profession because every health profession with a national responsibility is gearing itself for change and development in order to keep pace with needs of our growing population.

Osteopathic philosophy, from which the profession's current research program stems, represents a change from previous medical thinking. It shifts attention from disease to the individual, where adaptation failures and disease processes occur. In essence, it provides a unitary concept of health and disease as expressions of physiologic interrelationships among the systems of the human body as a whole organism interacting with the environment. To medical philosophy it contributes a concept of somatic factors as intrinsic causes in disease. This concept deals with the occurrence within the human body itself of certain fundamental alterations in structure and function in one or more body parts which impair the whole human organism or exaggerate or alter impacts of all stress factors which can affect the body.

The concept and sciences of the osteopathic profession's current research program are not apart from the over-all philosophy and sciences which feed other schools of medical practice.

Physiologic sciences are universal in medicine. For that reason, reports of investigators in other medical fields often support premises on which the current osteopathic research program is based. Also, discoveries in osteopathic research and practice provide a basis for understanding and developing further new concepts of the body's adaptation to stress, on which other scientific investigators are reporting.

Change in orientation of the profession's research program is encouraged by the changed direction which has occurred in other medical research. Until recently, infectious diseases were the central focus of other research activities. The essential problem was to identify and destroy the invading causative agent of disease.

That research approach did not include study of related physiologic factors within the body of the individual—the host to the invader and disease. Direction has shifted recently, with major attention now being given to the individual. With that change, medical research has become increasingly complex and varied. It has also become increasingly dependent on new technics, facilities, and disciplines, as medical and related sciences probe deeper into the secrets of life itself and the study of man's relation to his environment. Thus, other medical research through its present orientation approaches and supports the concepts and objectives of the osteopathic research program.

Our current need for research stems from the fact that much illness, especially the prevalent chronic diseases with long-term disabilities, reaches an irreversible point before diagnosis is made and definite treatment for their control and rehabilitation of the patient can be undertaken. An effective approach to this problem depends on more knowledge about basic causes and mechanisms of health and disease in man himself and on procedures for early detection and diagnosis of illness before it overwhelms its victim.

When progress has been made in this direction, more people can be given adequate preventive care or treatment early

enough in the course of disease that a better therapeutic response can be achieved.

Research programs for construction of health, restraint of disease, and rehabilitation of the disabled should extend across the entire forefront of (1) basic research in physiologic sciences and (2) the technologies of application.

Thus, there is need for more basic and applied research in normal interrelationships among body systems of man and the nature and mechanisms of his health and disease conditions. An example of the latter is the study of the marginal and small illnesses of everyday life as physiologic disorders and possible "building stones" for the most common diseases, including degenerative conditions of the vascular system, cancer, arthritis and rheumatic conditions, and metabolic disorders.

Scientific investigation should be extended into causes and nature of disease processes in which fibrous "scar" tissues destroy or replace functioning parts and thereby impair their normal physiologic activities.

Research should be extended into possible relationships between mental disorders, metabolic diseases, chronic fatigue states, and structural disturbances of the body's musculoskeletal system.

Pertinent to this discussion are the following important comments recently presented by Dr. Leonard V. Strong, Jr., before the Postgraduate Development Committee of the Osteopathic Hospital and Clinic of New York:

> One of the chief problems that has engaged the interest and energy of persons working on osteopathic research over many years is that of producing a musculoskeletal lesion. The Bureau of Research has encouraged this search by subsidizing at one time an understudy for Dr. Louisa Burns by recommending grants for and suggesting the use of sclerosing solutions. X-ray and electrical insult were used and currently work is under way with ultrasonic techniques. MacDonald at the University of Edinburgh made some progress on a mechanical method. The problem is to be able to effect a lesion on animals that is repeatable and reproducible by detached scientists and is still to be solved.
>
> Horizontal communication between the visceral and musculoskeletal systems is the subject of intense investigation, i.e., segmental disturbances in conjunction with a facilitated area. Vertical communication needs equal study, i.e., disturbances transmitted cephalad or caudad from facilitated areas may modify organization of the disease process or impair organization of the defense mechanism. The designing of experimental methods for such investigation is a long and arduous task.
>
> One of the most pragmatic results of research under osteopathic auspices has been the outcome of a blind experiment showing that palpable detection of facilitated areas is consistent with electromyographic and electrical skin resistance (E.S.R.) evidence of musculoskeletal lesions.
>
> On this base can be erected clinical studies with some prospect of credence.
>
> If osteopathic manipulative treatment is a force for good, improperly applied it is potentially a force for harm. Meticulous clinical observations should be made to ascertain whether focused torsion or stretching in one direction favors or detracts from recovery of impaired visceral function, aggravates or allays local inflammatory processes, etc., or if the reverse obtains.
>
> Mass surveys are indicated and the smaller the group and the shorter the period the more detailed must be the study.
>
> These are some of the enquiries that arise.

In addition to previously cited areas for scientific investigation, research programs must extend further into the fields of genetics, embryology, ecology, and other areas of biology related to medical sciences, to man, and to his environment.

The osteopathic profession recognizes these needs and shares in opportunities and responsibilities for medical research to the utmost of its available resources.

PART II. AVAILABILITY OF RESEARCH GRANTS

Availability of and continuity of grant support for research under osteopathic auspices is a continuing pressing problem for at least two major reasons:

First, a substantial volume of basic research must be firmly financed for long periods. The nature of fundamental investigation in medicine is such that studies may require several years of work.

Second, the administrators of each osteopathic college needs assurance of fairly constant support for the entire research program of the school and its teaching hospital. This is essential to recruiting and maintaining teaching and research personnel and to assess in advance what part of the institution's resources is to be committed to the college's research program as contrasted with that assigned to teaching.

A question which bears heavily on the profession's research program is how grant funds from supporting agencies may be divided in each year between new and continuing research projects. Receiving grant funds 1 or more years is no assurance or guarantee to an investigator of continued support. Assurance is earned by quality of sustained research activity and interest on the part of the investigator and the institution where the research is done. This is a matter of continuing challenge to those responsible for the profession's research program.

A sound policy on grant support must be based upon a balance between different but related objectives. It is as important to assist younger investigators, the future leaders in their fields, as it is to provide continuity of support for already existing research programs. Grant support should not be assured for an existing project to the exclusion of a new one with promise of more research productivity.

Such fundamental policies guide agencies within and outside the osteopathic profession in their distribution of research grants.

In addition, fund-granting agencies, in awarding research grants, are influenced by the integrity and competence of the scientists responsible for carrying out the research, the scientific merits of their program, and the climate or environment where the research is to be done. Environment includes attitude of the institution's governing body, availability of personnel and plant facilities, adequate time for research, and help as needed.

Grants in support of the profession's research program come largely from two general sources:

1. Agencies within the osteopathic profession.
2. Agencies outside the osteopathic profession.

1. *Agencies Within the Osteopathic Profession.*—

a. A.O.A. Bureau of Research:

The Bureau of Research of the American Osteopathic Association administers the profession's official research program. The "Policy Statement" under which it operates appeared in the Bureau's Report in September 1952.[1] It is also part of the Bureau's Manual of Procedure,[2] which is available in the library or research laboratory of each of the osteopathic colleges. The Grantee's Guide[3] covers certain highlights of the "Policy Statement," among which are the following:

> 1. The purpose of the program is to investigate those problems of a biological nature which will lead to a better understanding and a more effective application of the principles and concepts of osteopathy's contribution to the science of health.
>
> 2. While the areas of interest in research conducted under osteopathic auspices are broad enough to encompass all of the medical and biological sciences, the limited resources and facilities of the profession make necessary some selective emphasis. The Bureau feels that it should not invest from its limited funds in areas which are already under active investigation under other auspices, while areas opened by osteopathic research, theory, and practice are neglected. Investigators are encouraged to identify areas which need exploration and to seek out the best possible application of their own talents, skills, and interests to that exploration.
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> 3. The American Osteopathic Association is interested only in the highest quality of scientific investigation and limits its approval of applications to those projects which have reasonable promise of revealing important scientific knowledge.

Thus, to those who can qualify, the American Osteopathic Association's Bureau of Research supplies not only money with which to employ "hands" and buy "things"; it also supplies advisors and help in research planning and development.

An A.O.A. grant may be in support of a pilot or trial research or as a grant-in-aid to an established research program. It may be in the direction of a fellowship or to provide a supplement to a grant from other sources.

An A.O.A. research grant provides only partial support for a research project. The participating institution is expected to pay the major share of the research costs and to seek additional grants from other sources.

Responsibilities of research administration under A.O.A. grants are largely left to institutions to which grants are made. The Bureau requires, however, that use of funds and research reports on the project supported shall be in accordance with specifications in the institution's grant application and in the Bureau's notice of approval.

In addition to administering the profession's official research program, the Bureau promotes plans for increasing interest in careers in the scientific fields. It considers this activity one of its primary functions, especially at this time

when Federal and other health agencies are deeply concerned about the dearth of personnel for scientific fields.

Examples of this activity are:

1. The National Health Council has instituted a vigorous program through guidance personnel and health agencies to help solve the problem. The American Osteopathic Association is supporting and participating in this N.H.C. guidance and recruitment program.

2. The Bureau is interested in support for scholarships and fellowships in training programs which are available from the National Institutes of Health and other agencies.

3. Within the next year the Bureau will sponsor a research conference of young investigators in the colleges. The program will be designed for their special interest and benefit.

4. The Bureau within the next year will encourage and assist research personnel to take advantage of training opportunities offered through the National Institutes of Health at Bar Harbor, Woods Hole, and other laboratories. Support is available for qualified individuals from the National Institutes of Health.

5. A number of Public Health Service fellowships have been awarded to individuals engaged in research in our schools. The Bureau seeks to increase the number of such fellowships.

6. Plans are being studied for implementing osteopathic student attendance at scientific assemblies with financial assistance to be sought from agencies outside the A.O.A.

7. The Bureau offers consultation services to osteopathic investigators planning research grant applications to agencies outside the profession. New investigators are urged to avail themselves of this assistance.

b. Foundation for Research of the New York Academy of Osteopathy, Inc.:

Objectives of the Foundation are in accord with and support the profession's research program. Through grant support, the Foundation encourages research and education in physiologic sciences which will make available new knowledge and improved methods and skills essential in preparing well-trained physicians.

The Foundation has held three research conferences in which members of the Bureau and faculties of osteopathic colleges were participants.

The Foundation is managed with the following objectives:

1. To aid and assist investigation, research, and exploration of principles, methods, and technics relating to contributions of the osteopathic school of medicine in the service of health.

2. To grant awards, scholarships, and fellowships in support of research in basic and applied biologic and medical sciences which deal with man's health.

3. To secure information by research and scientific studies, forums, and conferences and to disseminate such information for use of all who are interested in betterment of human health.

4. To stimulate integration of basic and fundamental research into their clinical applications in specific disease entities, industrial medicine, physical and mental rehabilitation, and other health services.

5. To encourage cooperation among professions in the health field and other groups concerned with man's health and place in human society.

6. To establish objective forums dedicated to the utilization of scientifically established principles, theories, methods, and modalities of benefit to the health and development of mankind without bias or prejudice.

2. *Agencies Outside the Osteopathic Profession.*—

Agencies outside the osteopathic profession which have supported osteopathic research are largely governmental. These have included the United States Public Health Service and the Office of Naval Research.

Grants and Fellowship Programs of the U.S. Public Health Service:

Public Health Service grants and fellowships programs aid in the advancement of medical knowledge in the nation's research institutions by supporting research and training activities in the health, medical, and related sciences. The scope of these programs has increased tremendously during the past decade, giving impetus to the search for the basic causes underlying disease conditions and the development of more effective methods for diagnosis and treatment. The programs continue to encourage research interest in needed areas of investigation and to provide an opportunity for increasing America's supply of competently trained scientific personnel.

To those who can qualify, the National Institutes of Health, under the U.S. Public Health Service, offer research fellowships in the following categories: (1) senior research, (2), predoctoral, (3) postdoctoral, (4) special, and (5) part-time student research.

The Surgeon General of the Public Health Service has established a series of postdoctorate and special research fellowships to encourage the most brilliant and promising students and scholars in the United States in a career of research in the medical and allied fields. This Research Fellowships Program is supported from funds appropriated by Congress for the National Institutes of Health of the Public Health Service. Where one of the categorical institutes provides funds, the designation of that Institute identifies the fellowship. Where the fellowship falls in the general field, it is supported by the noncategorical funds of the National Institutes of Health and is so designated. Public Health Service Research Fellowships may, therefore, carry any one of the following designations:

National Institute of Arthritis and Metabolic Diseases
National Cancer Institute
National Institute of Dental Research
National Heart Institute
National Institute of Mental Health
National Microbiological Institute
National Institute of Neurological Diseases and Blindness
or
National Institutes of Health.

A recent act of Congress provides for construction grants through the U.S. Public Health Service to provide additional plant facilities for research and training research personnel at educational institutions, including osteopathic colleges.

Student fellowships for research training at Bar Harbor, Maine, Woods Hole, Massachusetts, and other research laboratories are available to those who can qualify.

Information regarding N.I.H. fellowships may be obtained through authorized agencies in the profession, including the administrative offices of the osteopathic colleges, the A.O.A. Bureau of Research, and the A.O.A. Department of Professional Affairs. In making application, each of these agencies should be informed and full information or copy should be furnished the A.O.A. Department of Public Relations, C. D. Swope, D.O., Chairman, Farragut Medical Bldg., Washington 6, D.C.

Types of Fellowships:

A *Postdoctorate Research Fellowship* is awarded to qualified persons holding a doctor's degree in medicine, dentistry, or related fields. This Fellowship carries a stipend of $3,400 a year; dependency allowances are available for dependent spouse and children at the rate of $350 for each dependent. Postdoctorate Fellowships renewed for a second year are increased $300 over the first year.

A *Special Research Fellowship* is awarded to qualified applicants who have a doctor's degree in medicine, dentistry, or related fields and, in addition, have demonstrated unusual competence for research or require specialized training for a specific problem. The stipend for this Fellowship is determined by the Surgeon General at the time of award.

A *Senior Research Fellowship* is to foster additional research training in the preclinical sciences of anatomy, physiology, biochemistry, microbiology, pharmacology, pathology, biophysics, genetics, and behavioral sciences in the medical schools, dental schools, and schools of public health. The program provides awards to support investigators between the completion of training and eligibility for permanent higher academic appointment. Although the major activity of the Fellow is to do research, applicant schools are expected to assign teaching and other responsibilities to promote the attainment of a well-rounded productive career.

There is flexibility in administration of these Senior Research Fellowships allowing modification of research, attendance at scientific meetings, and conduct of a portion of the work in another institution. If the investigator requires additional research funds, his school may request such support from the Public Health Service or any other agency.

Location of Work:

N.I.H. Research Fellows may undertake their studies at any qualified institution in the United States, including governmental research laboratories, where interests and facilities are appropriate for the specific type of training elected by the Fellow. Studies may be undertaken at institutions outside the United States only when satisfactory evidence is provided that the type or quality of training sought cannot be obtained in this country. It is the responsibility of the applicant to make all necessary arrangements for the conduct of his proposed Research Fellowship work, both with the institution where the work will be done and with the investigator under whom he will work.

Care and observation of patients directly involved in the research problem undertaken are considered to fall within research duties.

For those who desire to apply for awards permitting strictly clinical, nonresearch training, the National Cancer Institute, the National Institute of Mental Health, the National Institute of Neurological Diseases and Blindness, the National Institute of Arthritis and Metabolic Diseases, and the National Heart Institute provide a limited number of awards for such clinical training, the purpose of which is, among other things, to increase the number of physicians with special competence in these respective fields.

Other Agencies: Many agencies outside the profession interested in medical research have not supported the profession's research program, although they are showing increasing interest. It is anticipated that well-conceived research programs at our colleges and other institutions can and will receive assistance from such outside sources.

SUMMARY

Some issues which bear on the profession's research program and the availability of supporting grants have been reviewed. It has been pointed out that the profession's basic and applied research productivity and its output of research literature must be increased to keep pace with clinical practice and needs.

A list of agencies providing research grants in support of the profession's research program has been reviewed. A list of other possible sources in support of the profession's research program is available to those interested.

ADDENDUM

I. Definitions.—

1. Research Contracts: A contract in which the recipient agrees to do a research job *for* the awarding agency for a fee (usually on an actual cost basis or a cost plus profit basis). Example: Research contracts awarded by the Armed Services or the Atomic Energy Commission.

2. Research Grants: A grant-in-aid to assist a scientist in doing what *he* wishes to do; usually awarded on a cost plus percentage of overhead basis. Example: Public Health Service or National Science Foundation research grant.

II. Sources of Research Contract or Research Grant Support in the Medical and Related Sciences.—

A. Government:

1. Research Grants:

a. Public Health Service.—Awarded by the Surgeon General after review by one of the eight National Advisory Councils (expert non-governmental panels) of the National Institutes of Health. Funds are available for fundamental and clinical research in the medical sciences and in the sciences related to health (e.g., biology, psychology, et cetera). Awards are made on a scientific merit basis and cannot be made without prior approval of a Council.

b. National Science Foundation.—Funds are available for the support of *basic* scientific research in the mathematical, physical, medical, biologic, and engineering sciences. Awards are made on a scientific merit basis after review by expert non-governmental panels.

2. Research Contracts:

a. Armed Forces.—Funds are awarded by the respective services (Army, Office of Naval Research, Air Force) after review and advice by expert non-governmental panels of the National Academy of Sciences-National Research Council. Awards are not dependent upon a favorable opinion by the non-governmental panel, but are heavily influenced by it. The Office of Naval Research, Air Force, and Army, in that order of priority, have provided funds for medical and related research not essentially of a strict military nature, but of possible significance to the military (e.g., the preservation and storage of blood, the effects of stress upon physical performance, et cetera).

b. Atomic Energy Commission.—Through its Divisions of Research, Biology, and Medicine, contracts are available for biologic and medical research related to the development and use of atomic energy. Applied and fundamental research are supported in this program. A great majority of the projects fall in unclassified areas and can therefore be conducted without security restrictions.

c. Veterans Administration.—Contracts are made by the Veterans Administration for research applicable to the better care and treatment of veteran patients. Applications are reviewed in the Department of Medicine and Surgery, VA, and then by the National Academy of Sciences-National Research Council. Funds are *extremely* limited in this program.

B. Non-Government:

1. Research Grants:

a. National Academy of Sciences-National Research Council.—Funds have been made available to the Division of Medical Sciences by private and public organizations for the awarding of research grants on a project basis. The source and availability of funds vary from year to year. This organization operates primarily as a service organization for review purposes by subscription from organizations not having their own review mechanisms.

b. Public Agencies.—There is a wide multitude of public organizations with special categorical interests that make research grants to stimulate and support research in their areas of interest. Most of these organizations have their own review panels, although several do utilize the National Academy of Sciences-National Research Council.

c. The Life Insurance Medical Research Fund.—Grants are made available to investigators in order to provide financial support for projects designed to increase medical knowledge and thereby improve public health and longevity. Special interest is centered upon fundamental research aimed at the elucidation of general principles and processes with a bearing on the causation and development of disease. Research designed to improve diagnosis and treatment is supported in smaller volume. Applications are reviewed by a special panel of experts.

2. Research Contracts:

a. Pharmaceutical Houses.—Through research contracts (and occasionally research grants), funds are made available for fundamental and clinical research in areas of interest to the particular firms.

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3. Grantee's guide, A.O.A. Bureau of Research, published Feb. 6, 1956.

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DEPARTMENT OF PUBLIC AFFAIRS

DONALD M. DONISTHORPE, D.O.
Chairman

Bureau of Public Education on Health

ROSWELL P. BATES, D.O.
Chairman

H.R. 483

THE RECORD OF THE HEARINGS BEFORE THE SUB-COMMITTEE OF THE COMMITTEE ON ARMED FORCES OF THE UNITED STATES SENATE REGARDING THE COMMISSIONING OF DOCTORS OF OSTEOPATHY AS MEDICAL OFFICERS IN THE ARMED FORCES

▶ The Order Department of the American Osteopathic Association will soon have available for distribution printed copies of the record of the hearings held last year pertaining to the appointment of doctors of osteopathy as medical officers in the Armed Forces. These hearings related to the enactment of H.R. 483 by the United States Congress. This bill was signed by President Eisenhower on July 24, 1956, and is now known as Public Law No. 763 amending the Army-Navy-Public Health Service Medical Officers Procurement Act of 1947.

The printed record of the hearings constitutes an important historical document pertaining to the osteopathic school of medicine. No single document in existence today contains such a wide scope of information concerning the education and training of doctors of osteopathy, their licensing, the attitudes of both the medical and osteopathic professions, statements by important governmental officials, abstracts of state licensing laws, and even comments of state boards of medical examiners concerning state licensing laws. The questioning of doctors of medicine concerning the official position of the medical profession toward the osteopathic profession is most enlightening. The questions asked by Senators Symington and Jackson evidence an interest in the public health and the welfare of the personnel of the Armed Forces surpassing any personal interests in either the osteopathic or the medical profession.

In making copies of this record available, the American Osteopathic Association is performing a service which will contribute to the enlightenment of the public as well as the osteopathic profession. The document is one that should be in possession of all doctors of osteopathy, for within its covers are printed most of the important matters of information which a doctor should have at hand. For example, on pages 20 to 24 there is a list of the contributions to scientific literature by the members of the Kirksville College of Osteopathy and Surgery which have appeared in other than osteopathic publications. On page 69 are the dates when doctors of osteopathy were made eligible by law in the various states to receive a license including the right to perform major surgery and to use drugs. Commencing on page 93 is the testimony of Major General Silas B. Hayes, Surgeon General of the United States Army; on page 103, a statement of Rear Admiral B. W. Hogan, Surgeon General of the United States Navy; and on page 110, testimony by Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical), in which Dr. Berry, in response to a question asked by Senator Symington as to whether he is in favor of H.R. 483, states frankly: "I am in favor of it; yes."

It is hoped that members of bureaus of public education on health of the various divisional societies will take advantage of the opportunity to procure a copy of this important publication. All bureau members would benefit from a study of its contents.

DEPARTMENT OF PUBLIC RELATIONS

CHESTER D. SWOPE, D.O.
Chairman

Bills in Congress

▶ The first session of the 85th Congress convened January 3, 1957.

H.R. 9—Mr. Jenkins, of Ohio. Self-Employed Individuals' Retirement Act of 1957. Encourages establishment of voluntary pension plans by self-employed individuals, whereby such individuals may have their income tax deferred on a portion of their income which is paid into a restricted retirement fund, the tax to be paid on distributions from such funds beginning at age 55. Withdrawals before age 65 are subject to tax penalty.

H.R. 10—Mr. Keogh, of New York. Same as H.R. 9.

H.R. 43—Mr. Coudert, of New York. Permits income tax deduction for premiums paid on annuity and life insurance contracts.

H.R. 44—Mr. Coudert, of New York. Establishes a Commission on Programs for the Aging.

H.R. 45—Mr. Coudert, of New York. Individual Retirement Act of 1957. Similar to H.R. 9, except permits withdrawals before age 55 for disability, which shall be certified by licensed doctor of medicine or osteopathy.

H.R. 53—Mr. Teague, of Texas. Consolidates laws pertaining to administration of laws administered by the Veterans Administration.

H.R. 55—Mr. Teague, of Texas. VA Administrative Provisions Act.

H.R. 57—Mr. Teague, of Texas. Veterans' Hospitalization, Medical Care, and Burial Benefits Act.

H.R. 58—Mr. Teague, of Texas. Imposes additional requirements on certain veterans seeking VA hospitalization.

H.R. 82—Mr. Alger, of Texas. Terminates authority of Housing and Home Finance Administrator to make loans to educational institutions for housing construction.

H.R. 90—Mr. Auchincloss, of New Jersey. Requires premarital examination of all applicants for marriage licenses in the District of Columbia.

H.R. 95—Mr. Boland, of Massachusetts. Federal Scholarship Act. Provides for loans to enable needy and scholastically qualified students to continue post-highschool education.

H.R. 129—Mr. Curtis, of Missouri. To permit deduction of medical expenses without regard to maximum limitations of existing Internal Revenue Code of 1954, Section 213.

H.R. 191—Mr. Abernethy, of Mississippi. District of Columbia Nursing Act.

H.R. 195—Mr. Burdick, of North Dakota. Provides for deduction of $1,200 on the income tax of parents for each dependent in college for each year of attendance.

H.R. 231—Mr. Hillings, of California. Provides income tax credit for educational expenses for higher education.

H.R. 251—Mr. Keating, of New York. Similar to H.R. 45.

H.R. 286—Mr. Keating, of New York. Provides for income tax credit of subscription charges or insurance premiums with respect to health or medical service plans or programs, or health or medical insurance.

H.R. 306—Mr. Lane, of Massachusetts. Provides for program of grants and scholarships to encourage education and training in the field of nursing.

H.R. 373—Mr. Ostertag, of New York. Establishes a Commission on the Aging.

H.R. 380—Mr. Ray, of New York. Similar to H.R. 45.

H.R. 383—Mr. Rhodes, of Pennsylvania. Establishes Bureau of Older Persons within the Department of Health, Education, and Welfare.

H.R. 390—Mr. Rodino, of New Jersey. Similar to H.R. 95.

H.R. 396—Mr. Rodino, of New Jersey. Establishes Commission on Old-Age and Retirement Benefits.

H.R. 397—Mr. Rodino, of New Jersey. Encourages expansion of teaching and research in the education of mentally retarded children through grants to institutions of higher learning and to State educational agencies.

H.R. 489—Mr. Thompson, of New Jersey. Encourages extension and improvement of voluntary health prepayment plans or policies, by permitting voluntary agreements for pooling resources.

H.R. 490—Mr. Thompson, of New Jersey. Permits 30 per cent credit against individual income tax for amounts paid as tuition or fees to certain public and private institutions of higher education.

H.R. 495—Mr. Yates, of Illinois. Similar to H.R. 383.

H.R. 503—Mr. Byrnes, of Wisconsin. Regulating manufacture, compounding, processing, distribution, and possession of habit forming barbiturate and amphetamine drugs in intra-State commerce as necessary to effective regulation of interstate commerce in such drugs.

H.R. 504—Mr. Boggs, of Louisiana. Similar to H.R. 503.

H.R. 560—Mr. Bennett, of Florida. Provides scholarship program for training and procurement of scientists, engineers, technicians, medical personnel, and other skilled persons to meet the present and anticipated needs of the Armed Forces.

H.R. 562—Mr. Bennett, of Florida. Establishes Office for Senior Citizens in the Department of Health, Education, and Welfare.

H.R. 563—Mr. Bennett, of Florida. Amends Federal Unemployment Tax Act to prohibit approval of state laws unless they contain provisions for the payment of certain benefits during illness.

H.R. 564—Mr. Bennett, of Florida. To facilitate the procurement of doctors of medicine and doctors of dentistry for the Armed Forces, by providing grants and scholarships for education in the medical and dental professions.

H.R. 589—Mr. Celler, of New York. Establishes Department of Civil Defense within the Department of Defense.

H.R. 590—Mr. Chelf, of Kentucky. Increases income tax exemption for dependent child under 21 years of age while attending accredited business school, college, or university.

H.R. 615—Mr. Donohue, of Massachusetts. Similar to H.R. 95.

H.R. 620—Mr. Elliott, of Alabama. Establishes program of financial aid to students in higher education, by scholarships and by insurance of loans made to students by institutions of higher education.

H.R. 645—Mr. Ford, of Michigan. Amends Internal Revenue Code to treat as charitable contributions the tuition paid by the taxpayer for attendance of his children at a primary or secondary school.

H.R. 649—Mrs. Green, of Oregon. Similar to H.R. 383.

H.R. 655—Mr. Harrison, of Virginia. Grants nonprofit educational institutions exemptions from excise taxes which are now applicable to public educational institutions.

H.R. 712—Mrs. Kelly, of New York. Similar to H.R. 231.

H.R. 753—Mr. Lesinski, of Michigan. To provide health insurance for Government employees.

H.R. 760—Mr. Lipscomb, of California. Similar to H.R. 9.

H.R. 765—Mr. McCarthy, of Minnesota. Similar to H.R. 231.

H.R. 808—Mr. Multer, of New York. Permits income tax deduction for expenses paid for a dependent of the taxpayer attending a college or university.

H.R. 821—Mr. Multer, of New York. Similar to H.R. 95.

H.R. 825—Mr. Multer, of New York. Authorizes the President, under certain conditions, to control, regulate, and allocate for use and distribution of medicinal substances for the purpose of protecting and preserving the health of the American people.

H.R. 826—Mr. Multer, of New York. Similar to H.R. 589.

H.R. 1036—Mr. Zelenko, of New York. Similar to H.R. 231.

H.R. 1055—Mr. Bennett, of Florida. Establishes a United States Armed Forces Medical Academy.

H.R. 1064—Mr. Boggs, of Louisiana. Similar to H.R. 231.

H.R. 1073—Mr. Boggs, of Louisiana. Similar to H.R. 503.

H.R. 1092—Mr. Celler, of New York. Old-Age and Survivors' Hospitalization Insurance Act. Insures OASI beneficiaries against cost of hospitalization.

H.R. 1093—Mr. Dague, of Pennsylvania. Exempts from OASI any individual opposed to participation in the program of benefits on grounds of conscience or religious belief.

H.R. 1119—Mr. Elliott, of Alabama. Extends to permanently disabled persons the same tax treatment of their medical expenses as if they were 65 years of age.

H.R. 1162—Mr. Keogh, of New York. Provides income tax deductions for gifts to nonprofiit voluntary health insurance plans.

H.R. 1186—Mr. McDonough, of California. Provides 3-year carry-over for medical and dental expenses in excess of maximum tax deduction allowable under Section 23 (x) of Internal Revenue Code.

H.R. 1211—Mr. Poague, of Texas. Authorizes the Secretary of Health, Education, and Welfare to make loans to assist students in pursuing courses at colleges and universities in the United States.

H.R. 1235—Mr. Rooney, of New York. Requests world conference on cancer.

H.R. 1961—Mr. Metcalf, of Montana. Provides scholarships for high school graduates of Indian blood.

H.R. 1976—Mr. Osmers, of New Jersey. Provides scholarships in the fields of engineering, physics, chemistry, and other sciences closely related thereto.

H.R. 1979—Mr. Poague, of Texas. Authorizes the Secretary of Health, Education, and Welfare to make loans for the construction of nonprofit hospitals.

H.R. 2015—Mr. Kelley, of Pennsylvania. Scholarship Loan Insurance Act of 1957. Establishes program for insurance of loans made to assist students in the pursuit of higher education.

H.R. 2125—Mr. Holifield, of California. Establishes cabinet Federal Department of Civil Defense.

H.R. 2156—Mr. Huddleston, of Alabama. Provides aid to the States in the fields of practical nursing and auxiliary hospital personnel services.

H.R. 2178—Mrs. Rogers, of Massachusetts. Authorizes VA appointment of chiropractors.

H.R. 2193—Mr. Steed, of Oklahoma. Similar to H.R. 9.

H.R. 2220—Mr. Huddleston, of Alabama. Establishes Medical Advisory Committee on Alcoholism in the Department of Health, Education, and Welfare.

H.R. 2407—Mr. Brooks, of Louisiana. Raises to $25,000 the maximum limitation on tax deduction for medical expenses.

H.R. 2490—Mr. Reuss, of Wisconsin. Same as H.R. 9.

S. 175—Mr. Langer, of North Dakota. Allows additional income tax exemption for a dependent child who is a full-time college student.

S. 191—Mr. Langer, of North Dakota. To provide loans by the Commissioner of Education to individuals to enable them to obtain a college or university education.

S. 192—Mr. Langer, of North Dakota. To provide maternity leave for Government employees.

S. 258—Mr. Potter, of Michigan. Establishes United States Commission on the Aging and the Aged.

S. 380—Mr. Murray, of Montana. Indian Hospital Aid Act of 1956.

S. 395—Mr. Hill, of Alabama. To encourage expansion of teaching and research in the education of mentally retarded children through grants to institutions of higher learning, and to State educational agencies.

S. 432—Mr. Fulbright, of Arkansas. Allows additional income tax exemption for dependent child under 23 years of age who is a full-time student at an educational institution above the secondary level.

S. 433—Mr. Fulbright, of Arkansas. Allows taxpayer deduction of certain expenses incurred by him in obtaining a higher education.

McGuinness and Richardson join HEW

▶ Dr. Aims Chamberlain McGuinness was sworn in January 3, 1957, as Special Assistant for Health and Medical Affairs to the Secretary of Health, Education, and Welfare. He was appointed by President Eisenhower to succeed Dr. Lowell T. Coggeshall, who resigned to return to his position as Dean of the Division of Biological Sciences at the University of Chicago.

Secretary Marion B. Folsom administered the oath of office to Dr. McGuinness at the Department of Health, Education, and Welfare. Dr. Folsom said:

> We are sorry to lose Dr. Coggeshall and are grateful to him for his splendid work on behalf of the health of the American people during his service in the Department.
>
> We are fortunate to have the services of Dr. McGuinness, who brings to his new position a comprehensive medical background.
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> While the Department has an interest in all matters affecting the health of the American people, certain areas of health are engaging our special attention at this time. We are encouraging communities to develop hospital facilities more responsive to the needs of those who are not acutely ill, with emphasis on self-service by patients. We are also encouraging communities to build more chronic disease facilities and nursing homes, to serve primarily our increasing population of older people. We are seeking the expansion of health insurance on a voluntary basis, to help meet the rising cost of medical care. And we are especially concerned with the problems of costs of medical care for low income groups, particularly elderly people.
>
> Dr. McGuinness' knowledge and abilities will provide invaluable assistance in meeting these and other problems, and in the Department's total effort to help improve the individual and environmental health of the American people.

Dr. McGuinness received his A.B. degree from Princeton University in 1927 and his M.D. degree from Columbia University in 1931. Following internship at the University of Pennsylvania Hospital and Children's Hospital in Philadelphia, Dr. McGuinness began his practice of medicine as a private pediatrician in that city.

He has been a member of the faculty of the University of Pennsylvania School of Medicine since 1934, and assistant there to the associate professor of pediatrics from 1946 to 1951.

Dr. McGuinness acted as director of the Children's Hospital, Philadelphia, from 1948 to 1951. For 7 previous years he had served the hospital as assistant to the senior visiting physician. He served as Dean at the University of Pennsylvania Graduate School of Medicine from 1951 to 1954.

In 1954 he was clinical director of the Miners Memorial Hospital Association of the United Mine Workers Welfare and Retirement Fund. In this capacity he was instrumental in constructing and staffing hospitals in the mining areas of Kentucky. Dr. McGuinness won the praise of both the medical profession and labor organizations for his work. Following his duties in Kentucky, Dr. McGuinness returned to private practice in Philadelphia.

As a Lieutenant Colonel in the United States Army during World War II, Dr. McGuinness served as assistant administrator for the Army Epidemiological Board. He was awarded the Legion of merit.

Dr. McGuinness, an examiner for the American Board of Pediatrics, belongs to a number of professional societies, including the American Medical Association, the Association of Medical Colleges, and the American Academy of Pediatrics.

Elliot Lee Richardson was sworn in January 2, 1957, as Assistant Secretary of Health, Education, and Welfare. He was appointed by President Eisenhower, January 1, 1957, to succeed Roswell B. Perkins, resigned.

Mr. Richardson will assist in the development and coordination of the Department's program, especially in the activities related to legislation.

Mr. Richardson was graduated from Harvard College in 1941. He received an LL.B. from Harvard Law School in 1947, where for 2 years he acted as editor and editor-in-chief of the *Harvard Law Review*.

He is a director and member of the Executive Committee of Salzburg Seminar in American Studies, an international education project; a trustee of Radcliffe College; a member of the Overseers Committee to Visit the Harvard Law School; and Secretary of the Massachusetts General Hospital and Secretary, exofficio, of its Board of Trustees. In addition to these activities, he has been active in his own community in work for the Red Cross and the Heart Fund.

VA reduces paper work of "home town" doctors

▶ Paper work will be cut for veteran-patients with service-connected disabilities that require long-term outpatient treatment, and for the "home town" doctors who treat them under Veterans Administration authorization.

Dr. A. J. Klippen, deputy director for clinics in VA central office at Washington, D. C., said the new system of sharply reduced billings and forms went into effect January 1, 1957, in most areas.

In eight States—California, Colorado, Michigan, North Carolina, Oregon, South Dakota, Washington, and Wisconsin—and in Hawaii the effective date will be July 1, 1957, Dr. Klippen said.

The simplified method involves individually selected long-term patients and their doctors, Dr. Klippen said.

About 40,000 doctors and 637,000 veterans are participating in the program, he said.

Specific changes to be made under the new system are:

1. Doctors caring for the selected chronic patients will receive authorization from VA to continue treatment for periods up to 1 year, instead of having to submit a monthly request to continue treatment as at present.

2. These doctors may submit reports to VA on the medical condition of patients at the end of 3 months instead of each month as at present. By cutting down on the frequency of reports, VA hopes doctors will have time to describe the medical condition of patients more fully.

3. *These doctors may submit their monthly bills to a VA regional office on the individual doctor's letterhead stationery instead of on VA forms.*

4. Certain veterans in the hometown program who must travel to cities near their homes to visit medical specialists will receive travel authorization to cover the entire authorized treatment period instead of monthly travel authorization as at present.

Monthly paper work for chronic veteran-patients has become a burden to busy doctors pressed by a load of medical work and the necessity of making out-of-town trips.

Delay by doctors in submitting requests to continue treatment has resulted in some cases in delay in issuance of travel authorization for veteran-patients and in occasional loss of payment by the doctor until a new authorization for treatment could be issued by VA.

Dr. Klippen said veterans who may be placed under the new system are those already receiving treatment in the home town program for service-connected disabilities requiring extended periods of treatment, such as diabetes, chronic chest conditions, gastrointestinal and vascular diseases, and neurological conditions.

The new system not only will benefit veterans and fee-basis physicians, but also will conserve use of VA personnel, supplies, and office space.

Current Literature

"Hypertrophy" of the ligamentum flavum simulating the protruded lumbar disk syndrome

▶ A CASE OF "HYPERTROPHY" of the ligamentum flavum cured by resection of the affected ligament is presented in the December 12, 1956, issue of *Proceedings of the Staff Meetings of the Mayo Clinic.* Isolated hypertrophy of the ligament occurs infrequently. A study of the literature reveals an incidence of less than 3 per cent of lesions causing low-back and sciatic pain. The most common site is between the last two lumbar vertebrae, which was the site in the case reported by William S. Pollard, M.D., and Hendrik J. Svien, M.D.

Pathologic studies of "hypertrophic" ligaments have demonstrated ligamentous thickening, degeneration of elastic tissue, and vascular changes. Actually the term "hypertrophy" is a misnomer because the thickening is really a fibrosis. Mature elastic tissue probably does not even regenerate, much less hypertrophy.

Symptomatology will depend on the extent of thickening and its level in the vertebral axis. Back pain alone may be present, or it may be associated with leg pain of a referred type. Referred pain is characteristically vague in its distribution with considerable variation in site and intensity. Diagnosis is usually made at operation when it can be seen that the ligament is large, white instead of yellow, and fibrotic.

The ligamentum flavum syndrome should be considered whenever a patient is convincingly disabled although exhibiting few objective signs. Sometimes myelography will demonstrate the posterior extradural defect. Surgical treatment offers considerable promise.

Hypofibrinogenemia in surgical patients

▶ AFIBRINOGENEMIA AS a cause of severe hemorrhage has usually been associated with obstetric emergencies such as abruptio placentae, amniotic fluid infusion, or the dead fetus syndrome. In the October 1956 issue of *Surgery, Gynecology and Obstetrics,* Louise L. Phillips, Ph.D., Peter T. Rowley, M.D., and David V. Habif, M.D., present a report of nine cases of surgical patients with hemorrhagic diathesis of the type generally associated with hypofibrinogenemia.

In these cases the term "hypofibrinogenemia" is used to distinguish between low levels and almost total lack of fibrinogen as encountered frequently in obstetrics. Symptoms include oozing from incised tissues, from venipunctures, and occasionally from mucous membranes. A wide variety of operations is represented in this study which would seem to indicate that hypofibrinogenemia can take place in almost any operative procedure.

Fibrinogen levels under 200 mg. per 100 ml. of plasma (the lower limit of normal) were frequently found. These levels, although between 125 and 175 mg., are not generally believed dangerous, but bleeding typical of that from hypofibrinogenemia was encountered. Multiple transfusions which are given routinely during surgery may have kept fibrinogen levels from falling as low as those seen in obstetric patients who do not receive transfusions unless unusual bleeding is noted. Blood taken postmortem revealed little or no fibrinogen in the plasma of two patients, however. In most instances, evidence of proteolytic activity could be shown either by means of lysis of clots, by hydrolysis of fibrinogen or casein as determined spectrophotometrically, or by the presence of increased trichloracetic acid–soluble hydrolysis products in the plasma.

With the first appearance of abnormal bleeding during and following surgery, blood samples should be drawn for fibrinogen determinations. A concentration below 175 mg. per 100 ml. is considered suspect and may be an indication for the commencement of fibrinogen therapy. A clotted sample is studied for lysis. Levels should be checked at frequent intervals until clinical improvement is noted and until blood levels have returned to normal or at least have begun to rise.

Early diagnosis, prompt intravenous administration of fibrinogen, and maintenance of vital signs with adequate but not excessive blood replacement have generally resulted in recovery of the patient. In instances in which fibrinogen administration was delayed or did not take place, death resulted despite transfusions of whole blood in quantities up to 26,000 ml.

Two of the patients in this study who were in the group receiving fibrinogen developed homologous serum jaundice. One of these subsequently died of acute yellow atrophy.

Progressive fluctuating muscular rigidity and spasm ("stiff-man" syndrome): report of a case and some observations in 13 other cases

▶ "STIFF-MAN SYNDROME" is the label which Frederick P. Moersch, M.D., and Henry W. Woltman, M.D., have given to fourteen cases of progressive fluctuating muscular rigidity and spasm seen at the Mayo Clinic over a 32-year period. Although neither the cause nor the cure for this condition is known, areas for future study are indicated in the report appearing in the July 25, 1956 issue of *Proceedings of the Staff Meetings of the Mayo Clinic.*

Ten of the fourteen patients seen by the authors were male; four were female. The age at onset of illness varied from 28 years to 54 years. The duration of the illness ranged from 2 to 15 years. Seven patients are still living, four are dead, and three are not now available for examination.

In eleven of the patients the primary initial complaint was stiffness, rigidity, or tightness of muscles. Muscle spasm was the chief complaint of the remaining three patients. Pain was present in all cases, but a major consideration in only four.

The onset of symptoms occurred over a period of several months in ten cases, several weeks in two cases, and several days in two cases. Six patients reported that the muscles of their trunk were first affected; four, the muscles of the neck and shoulders; and four, the muscles of the limbs. In all cases, other muscles became involved as the affliction spread. Involvement of the hands and feet was minor, and the facial muscles were unaffected. In twelve of the fourteen cases, muscles of the back and abdomen eventually became predominately affected. The terms "hard," "firm," or "boardlike" were frequently used to describe the state of the abdominal muscles.

As a result of over-all rigidity, the head was drawn into the shoulder girdle and the spinal column into kyphosis, lordosis, or a condition that superficially resembled poker spine. The gait was laborious and stiff, hence the tag "stiff-man syndrome." The degree of rigidity varied from time to time in all patients. Sudden stimulus, such as a fright or a jar or movement, frequently precipitated spasm.

Routine physical examination demonstrated no findings of diagnostic significance; neurologic examination revealed only fluctuating muscular rigidity and spasm, and laboratory findings were within normal limits in all but three cases. Four patients were revealed to have mild diabetes, and six patients demonstrated a moderate degree of hypertrophic arthritis of the spinal column. Most of the patients maintained a normal or nearly normal mental state, considering the chronic and incapacitating nature of the illness.

Numerous treatments of various types have been tried to no avail. Limited relief was sometimes achieved by baths and passive or active exercise, and moderate sedation was helpful to a degree but without lasting results. Because of the fluctuating intensity of the symptoms and because four patients had reducing substances in the urine, the authors feel that a metabolic basis for the disease should be considered.

Centralized treatment for seriously ill surgical patients

▶ A PRACTICAL SOLUTION to the problem of caring for the critically ill surgical patient despite a continuing shortage of trained nursing personnel is presented in the October 6, 1956, issue of *The Journal of the American Medical Association* by J. Murray Beardsley, M.D., J. Robert Bowen, M.D., and Carmine J. Capalbo, M.D.

In the new Rhode Island Hospital, the seriously ill patients are not placed in the general wards but are concentrated in two adjacent special care units situated one floor above the operating and recovery rooms. In these units, the nursing station is placed in the center of each wing rather than at the base of the two wings. Because of the extensive use of glass partitions, practically every patient is visible from the nursing station. Each special care unit has private, two-bed, and four-bed rooms (28 beds in all), sleeping quarters for a full-time resident, a laboratory, a minor surgery room, and a large dressing room. Each bed is provided with a suction outlet, an oxygen device, and a sphygmomanometer on the adjacent wall. An emergency switch is situated near each nursing station, and the signal can be heard in the resident's quarters.

The special care unit is staffed by one supervisor, two head nurses, nine other graduate nurses, eight practical nurses, four orderlies, one general duty aide, one dressing room aide, and a full-time surgical resident. Nonrotation of personnel is the rule. This makes possible a continuing group of trained people who can become familiar with the patients from day to day contact. Each nurse is trained to draw blood and administer fluid intravenously. All personnel have been made acutely conscious of the necessity for accuracy in noting the quantity and character of tube drainage, total daily intake and output, degree of moisture in the tracheobronchial tree, and significant changes in blood pressure and pulse.

Any emergency patient may be admitted directly to the special care unit at the discretion of the resident in charge. Surgical patients are admitted directly from the recovery room upon the recommendation of the surgeon and anesthetist. The decision as to when special care is no longer required is left largely to the resident in charge, although as a matter of courtesy he usually consults the visiting surgeon before actually moving the patient. The final decision regarding admission or discharge is vested in the chief of surgery.

Over-all administration of the unit is in the hands of two committees. The higher echelon or policy-making committee consists of the hospital director, the director of nurses, the chief of surgery, and the chief of anesthesiology. The lower echelon or working committee consists of one member of the surgical service as chairman, one member of the department of anesthesiology, the senior surgical resident, the special care resident, the chief of nursing service, the director of records, and one member of the administrative staff.

Among the benefits to be derived from segregating critically ill patients in special care units are: (1) assurance that expert care is guaranteed those who need it most; (2) relief of pressure in other areas, lessening the need for graduate nurses and allowing for more extensive use of auxiliary personnel; and (3) reduced demand for private duty care for individual patients.

The pre-accident patient—diagnosis and treatment

▶ IN THE OCTOBER 1956 issue of *Industrial Medicine and Surgery*, Morris S. Schulzinger, M.D., describes diagnostic criteria and therapeutic procedures whereby the preaccident patient can be identified and the impending accident prevented.

Accidents are endemic in nature and conform to the same biologic laws as disease. They occur most often in the young, the male, and the maladjusted. Environmental hazard, temporary or prolonged personal impairment or maladjustment, and faulty behavior under stress are the ingredients of all accidents. Diagnosis of the accident syndrome is largely based on a careful history and medical examination.

Among the factors determining susceptibility to accidents are: age, sex, season, time of day, type of activity, exposure to hazards, personality, emotional stress, subconscious conflicts, morale, uncontrolled aggression, adaptability, intelligence, experience, home environment, early childhood experiences, early exposure to accidents, physical handicaps, alcohol or drug consumption, state of health, fatigue, exposure to noxious agents, physiologic and psychologic impairment and maladjustments, and behavior under stress.

The preaccident patient often has a preoccupied distant look; he may be laden with anxieties and under visible emotional stress. There is frequently a deterioration of performance and there may be impairment of perception. As a rule, he does not recognize or appreciate that his standard of performance is deteriorating.

Preaccident therapy is mostly nonspecific and is aimed at controlling or curing the impairments and maladjustments revealed by the medical examination of the patient. Psychiatric help may be needed when specific psychologic conflicts are revealed. In any instance, the first concern of treatment is to protect the patient against the impending accident.

As a rule, patients may be divided into three groups on the basis of the nature and severity of their impairments and anticipated hazards: (1) those who are safe for exposure to hazards, (2) those who are unsafe, and (3) those who are safe for limited exposure. Many patients derive therapeutic benefit from a mere evaluation of their accident potential. Some may require superficial psychotherapy, correction of specific impairments and maladjustments, a course of training in safe practices, or a change of employment, but relatively few preaccident patients will require deep psychotherapy.

From a long-range point of view, accident prevention should begin in childhood. Indoctrination in safety habits and in the art of safe living will help to "immunize" children against accidents. Equally important is continued exposure to a peaceful, orderly, secure, and loving home environment. Community efforts should be directed toward (1) dissemination of principles of mental health which have a bearing on accidents, (2) teaching of safety habits, (3) elimination of environmental and situational hazards, (4) enactment of enlightened laws and their uniform enforcement, and (5) establishment of preaccident clinics and other medical facilities for the diagnosis and treatment of traffic offenders, accident repeaters, indigent preaccident patients, and others.

Because of the speed with which accidents take place anticipation must be considered the essence of accident prevention in all human activities. Individual limits of perception, reaction time, and psychomotor skill must never be exceeded. Potentially dangerous situations must be recognized in advance, and individuals must be trained to operate efficiently and semiautomatically under stressful conditions.

BOOK REVIEWS

▶ *Books for review which were received during the period from December 5 to January 5 are listed on advertising pages 98 and 99. Reviews of these books will be published as space permits.*

▶ THE DIAGNOSIS AND TREATMENT OF POSTURAL DEFECTS. By Winthrop Morgan Phelps, M.D., Medical Director, Children's Rehabilitation Institute for Cerebral Palsy, Baltimore; Consultant in Cerebral Palsy for the States of New York, New Jersey, Delaware, Maryland, Pennsylvania and others; Robert J. H. Kiphuth, M.P.E., Professor of Physical Education, Yale University; and Charles Weer Goff, M.D., Associate Clinical Professor of Orthopaedic Surgery and Lecturer in Anatomy, Yale University School of Medicine; Attending Orthopedic Surgeon, Newington Home and Hospital for Crippled Children; Visiting Professor of Physical Anthropology, Hartford Seminary Foundation; Member, Society for Research and Child Development; Late Member, Posture Committee, American Academy of Orthopaedic Surgeons. Ed 2. Cloth. Pp. 190, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

The value of this book is largely academic, but as such contains the kind of information that is absolutely basic to intelligent counseling and any corrective program that concerns posture. The new revision of the 1932 publication incorporates the changes that were made known through the study of military personnel during World War II, as well as the influence of Simpson's quantum evolutionary hypothesis.

Subjects covered are fairly broad, including evolutionary influences on the posture of men, environmental influences, normal adult posture, abnormal varieties of posture, body mechanics, postural examination, posture in physical education, and corrective exercises for strengthening. Since the original publication, new research has been done in classifying body types, and a greater knowledge of growth processes in children has been demonstrated. There is a great wealth of illustrative material by way of photographs and diagrams.

For general information and instruction in the treatment of postural defects, this book will serve physician and physical educator alike, giving to both the combined scope so valuable in broadening understanding.

▶ TEXTBOOK OF MEDICAL PHYSIOLOGY. By Arthur C. Guyton, M.D., Professor and Chairman of the Department of Physiology and Biophysics, University of Mississippi School of Medicine. Cloth. Pp. 1030, with illustrations. Price $13.50. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1956.

A new student text in physiology has been prepared from the author's teaching experience of 9 years. After considerable experimentation with texts and materials, he has chosen the information which he considers of greatest worth and incorporated it into a single usable book.

The author recognizes that it is a monumental undertaking to compile a text in physiology, single-handed. However, he sees the advantages of a single approach as far outweighing its faults, particularly while the student is establishing basic patterns of thinking in this field. He feels that a more balanced emphasis on the various parts of physiology can be obtained through single authorship than through collaboration, and that this is especially important in gaining a uniform perspective as a basis for later thinking.

One interesting feature of his approach is the classification of material, choosing a larger type face for the more important information. He feels that this is an aid for students, who may experience difficulty in gleaning major facts from a vast bulk of reading matter.

The author's love for physiology as a pure science, and his obvious willingness to experiment with teaching methods, should make this new text a valuable contribution to the field. It would be well, however, to make good use of the carefully selected bibliography in supplementary study.

▶ BIOCHEMICAL MECHANISMS IN INFLAMMATION. By Valy Menkin, M.A., M.D., Head of Department of Experimental Pathology, Agnes Barr Chase Foundation for Cancer Research; Associate Professor of Experimental Pathology, Temple University School of Medicine; Formerly, Assistant Professor of Pathology, Duke University School of Medicine; Formerly, Assistant Professor of Pathology, Harvard University Medical School. Ed. 2. Cloth. Pp. 438, with illustrations. Price $9.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

The second edition of this extensively read monograph in The Bannerstone Division of American Lectures in Dentistry has been fully revised and considerably enlarged, consisting as it does of ten chapters, instead of the original five. The basic work has been enriched with many new observations by the author and numerous other investigators. Hitherto unpublished information, gathered in the Harvard Laboratories, on the concentrations of inorganic elements in the exudates of inflamed tissues has been incorporated into the text, and its possible significance has been evaluated.

The fascinating problem of the mechanism of repair in the healing of an inflammatory lesion merits a separate chapter in the new edition. Under this general topic, the relation between cellular injury and the development of neoplastic manifestations, both benign and malignant, are discussed, as is the possible relation between growth-fostering exudates and precancerous lesions.

The author attempts to clarify the relation between hormonal influences and the regulatory processes of the nervous system on the one hand and local inflammatory reactions on the other. He offers a critical survey of the relation between diabetes and inflammation as well as experimental data on the relation between pyrexin and the bacterial pyrogens.

An entire chapter is devoted to the anti-inflammatory mechanism of the corticosteroids and ACTH. There are special chapters also on the immunologic implications of inflammation and the status of leukotaxine and the local migration of polymorphonuclear leukocytes in inflammation.

The volume is richly illustrated and contains many useful graphs and tables. Each chapter is lucidly summarized and amply documented. An index of authors and an index of subjects are incorporated.

The favorable criticism with which the first edition of the monograph was greeted undoubtedly gave Dr. Valy Menkin added incentive for bringing his material on one of the most

intriguing aspects of pathology up to date. Dr. Menkin is the head of the department of experimental pathology of the Agnes Barr Chase Foundation for Cancer Research. His monograph stresses the relation between the reparative reaction and the intermediate stages that lead to lesions resembling precancerous tissue in some animals. One could find no more authoritative discussion of inflammation than this one, based on the author's vast clinical and experimental experience and coupled with a scholarly survey of the pertinent literature.

For an understanding of the present knowledge of the biochemical changes that occur in a severely injured cell, to produce the typical inflammatory reaction as well as the related problems that are yet to be explored, this monograph is an important contribution.

▶ **Ciba Foundation Symposium Jointly with the Physiological Society and the British Pharmacological Society on HISTAMINE in honour of Sir Henry Dale, O.M., G.B.E., M.D., F.R.C.P., F.R.S.; Editors for the Ciba Foundation, G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Cecilia M. O'Connor, B.Sc. Cloth. Pp. 472, with illustrations. Price $9.00. Little, Brown and Company, 34 Beacon St., Boston 6, 1956.**

This book was published with the purpose of gathering and correlating the latest findings of international authorities in histamine research. It is a compilation of papers and discussions presented at a recent session of the Physiological Society and the British Pharmacological Society and the Ciba Foundation symposium. Central topics are the occurrence of histamine in the body, the release of histamine, the origin and significance of histamine in the body, the origin and fate of histamine in the body, the location of histamine, and the mechanism of histamine research. References are included with each paper and the book is indexed by subject and author. Records of the group panels, a unique feature of the Ciba symposium, reveal the fascinating interplay of scientists' minds as well as pertinent research data.

▶ **CIBA FOUNDATION COLLOQUIA ON AGEING. Volume 2. Ageing in Transient Tissues. Editors for the Ciba Foundation, G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Elaine C. P. Miller, A.H.W.C., A.R.I.C. Cloth. Pp. 263, with illustrations. Price $6.75. Little, Brown and Company, 34 Beacon St., Boston 6, 1956.**

This account of ageing in transient tissues is the second volume in Ciba's *Colloquia on Ageing*. The first volume dealt with the general aspects of ageing. The second symposium was planned to explore the possibility of drawing valuable inferences regarding the over-all process of ageing from data related to specific tissues whose life is shorter than that of the organism as a whole. Among others, the discussion included ageing of the placenta, reproductive system, deer antlers, erythrocytes, and senescent leaves. The book, which follows the Ciba series format, is well indexed and illustrated. For its content as well as its extensive listing of past and current research, it should be welcomed by those concerned with this subject.

▶ **THE SUPPORT OF MEDICAL RESEARCH. A Symposium organized by The Council for International Organizations of Medical Sciences. Established under the joint auspices of U.N.E.S.C.O. and W.H.O. Edited by Sir Harold Himsworth, chairman of the Conference; and J. F. Delafresnaye, C.I.O.M.S. Cloth. Pp. 170. Price $4.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.**

With the dedicated passion of scientists, directors of research from seventeen countries surveyed the problems of medical research—its organization, recruitment of personnel, and support—and proposed concepts to guide its future development. This international symposium was held in October 1955 at the Royal Society of Medicine in London and was arranged by the Council for International Organizations of Medical Sciences, a body supported by U.N.E.S.C.O. and W.H.O.

The published proceedings of this meeting are a thoughtful evaluation of the methods used in promoting medical research. From these considerations, the scientists have recommended principles to guide the future course of medical research. These proposals are concerned with support of medical research in the universities, the traditional seat of research, and in the central research organization, which is a new but necessary and established development, and cooperation and interchange of personnel and facilities between the two which will best aid the progress of medical research. In addition they call for a reappraisal of the research worker—his training, selection, and support. The means and scale of his support is perhaps their most indefinite proposal.

The reports of each participating nation regarding its own program of medical education and research are a valuable appendix. For an excellent presentation of the concepts involved in encouraging medical research as well as for the information regarding the program of other nations, this book should be on the shelves of the physician, the teacher, the scientist, and the educator.

▶ **THE BLOOD-BRAIN BARRIER with special regard to the use of radioactive isotopes. By Louis Bakay, M.D., F.A.C.S., Instructor in Surgery, Harvard Medical School; Assistant in Neurosurgery, Massachusetts General Hospital, Boston, Massachusetts. Cloth. Pp. 154, with illustrations. Price $5.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.**

Many substances that circulate freely in the blood stream and saturate most other organs are prevented from or delayed in entering the central nervous system by a physiologic barrier, the exact nature of which is not yet fully understood. That such a mechanism exists had been known for some time. In the attempt to identify the mechanism involved, many investigators have originated or contributed to theories as to the anatomic location of the barrier.

Studies conducted by tracing the passage of radioactive isotopes from the plasma into the intercellular fluid of the central nervous system have provided the material for the concept of the principles involved in the blood-brain barrier in normal health and in disease. Never before the use of radioactive tracers has it been possible to gain an accurate understanding of the quantitative values of the substances exchanged between the central nervous system and its environment. Neither has it been possible to observe the pathologic changes that take place in the human being without introducing hazards to the patient.

In this brief volume the history and various theories about the location of the obstructive mechanism are presented, and current concepts of its physiologic function under normal conditions are discussed. The author's own experimental technics are briefly reviewed, after which four chapters are devoted to studies conducted with radioactive isotopes. The normal function of the blood-brain barrier was studied on the basis of concentrations of various isotopes, particularly radioactive phosphorus, in the central nervous system. The areas of normally increased permeability are identified.

The existence of the blood-brain barrier has been conclusively confirmed in all mammals and it appears also to exist in all vertebrates. Its existence in the animal embryo has been proven, and its greater permeability in the fetus and the newborn has been established. This permeability may change as conditions change, and a number of conditions affecting the permeability of the barrier are discussed briefly. More extensively covered are the effects wrought on the function of the blood-brain barrier by brain injuries, cerebral thrombosis, embolism, hemorrhage, infection, and cerebral tumors.

The author, a neurosurgeon and an instructor of surgery at Harvard Medical School, points out that many observations of the function of this unique physiologic mechanism are impossible to track down because they have been coincidental to investigations not primarily concerned with the barrier. He does, however, cite 170 sources in the medical literature of the world, which are specifically concerned with this phenomenon.

It is hoped that a full understanding of the principle of the blood-brain barrier will make it possible to gain knowledge of the causes of those lesions of the nervous system and those cerebrovascular disorders that are still beyond our understanding.

ADVISORY BOARD for Osteopathic Specialists and Boards of CERTIFICATION

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SEVERAL SPECIALTY BOARDS in osteopathic medicine were in the process of formation prior to 1939 and the demand for others was recognized. Osteopathic specialists and the osteopathic profession felt the need of a single authoritative agency to define graduate education, establish minimum standards that would be basic to such education, furnish information on procedure to the specialty groups, coordinate their efforts, and protect the public by giving validity to certification. To meet these needs, the Advisory Board for Osteopathic Specialists was organized in 1939 by authorization of the Board of Trustees of the American Osteopathic Association. The Advisory Board rendered immediate assistance to existing specialty groups in their efforts to initiate and maintain minimum standards of graduate education against the time when individuals in various specialties would be prepared for certification. It helped in the establishment of additional boards of certification as the growth of specialties within osteopathic medicine demanded.

Certifying boards need assistance in determining the standards of fitness and ability of each applicant for certification as a specialist, they require guidance in defining the scope of the several accepted specialties, and they need advice in establishing standards of education and training for these specialties. An authoritative agency of the Board of Trustees of the American Osteopathic Association is required to maintain a cooperative effort between the certifying boards and educational and training-hospital groups, in order that graduate educational facilities will be constantly available to students in the various specialty fields. By the creation of an advisory board it was possible to obviate duplication of effort, to promote uniformity in the methodology of certification, to prevent unofficial groups from assuming the right of certification, and to inform the profession at large of the significance of specialty certification and its relation to the general practitioner.

The Advisory Board is composed of the secretaries of the approved certifying boards and one other appointed representative from each of the boards, two representatives of the Board of Trustees of the American Osteopathic Association, and representatives from such other national groups as are interested in the education, examination, and certification of osteopathic specialists.

Member organizations comprising the Advisory Board of Osteopathic Specialists are twelve boards of specialty certification, the Board of Trustees of the American Osteopathic Association, the Bureau of Professional Education and Colleges, the Bureau of Hospitals, the American Association of Osteopathic Colleges, and the Central Office of the American Osteopathic Association. The voting membership totals 30.

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Basil Harris — Glennard E. Lahrson
Alternate: Neil R. Kitchen

AMERICAN OSTEOPATHIC BOARD OF NEUROLOGY AND PSYCHIATRY
K. Grosvenor Bailey — Cecil Harris

AMERICAN OSTEOPATHIC BOARD OF OBSTETRICS AND GYNECOLOGY
Dorothy J. Marsh — Jacquelin Bryson

AMERICAN OSTEOPATHIC BOARD OF OPHTHALMOLOGY AND OTORHINOLARYNGOLOGY
Ralph S. Licklider — J. Ernest Leuzinger

AMERICAN OSTEOPATHIC BOARD OF PATHOLOGY
Robert P. Morhardt — Norman W. Arends

AMERICAN OSTEOPATHIC BOARD OF PEDIATRICS
Evangeline N. Percival — Mary E. Golden

AMERICAN OSTEOPATHIC BOARD OF PHYSICAL MEDICINE AND REHABILITATION
Robert C. Ruenitz — William W. W. Pritchard

AMERICAN OSTEOPATHIC BOARD OF PROCTOLOGY
Carlton M. Noll — Carl S. Stillman, Jr.

AMERICAN OSTEOPATHIC BOARD OF RADIOLOGY
W. L. Tanenbaum — D. W. Hendrickson
Alternates: Paul T. Lloyd, George W. Rea

AMERICAN OSTEOPATHIC BOARD OF SURGERY
James M. Eaton — Charles L. Ballinger
Alternate: Ernest G. Bashor

COMMITTEES, 1957

Executive Committee:
Thomas J. Meyers, Chairman
Carlton M. Noll, Vice Chairman
Robert A. Steen, Secretary
Norman W. Arends
K. J. Davis

Review Committee (three members):
Appointed annually not later than 30 days before the time of annual meeting.

Appeal Committee (five members):
Appointed when deemed necessary by the Chairman of the Advisory Board with the approval of the Executive Committee.

Committee on Basic Documents:
K. J. Davis, Chairman
Glennard E. Lahrson
Robert A. Steen

REVISED RULES OF ORGANIZATION AND PROCEDURE

ARTICLE I

Sec. a. The name of this body shall be the Advisory Board for Osteopathic Specialists.

Sec. b. This Advisory Board is constituted and functions under the auspices of the Board of Trustees of the American Osteopathic Association to which it serves as an advisory body and from which it receives authority to engage in those activities necessary to fulfill its purposes. Actions of this Board to have effect must be approved by the Board of Trustees of the American Osteopathic Association.

ARTICLE II—PURPOSES AND DUTIES

The purposes and duties of this Board shall be the following:

Sec. a. To assist in the establishment of certifying boards which shall determine the fitness and ability of each applicant for certification as a specialist in a distinct and recognized specialty.

(1) To be accepted as a certifiable field of specialization such specialty must be accurately definable, must be represented by a reasonable number of individuals who confine themselves or give the preponderance of their time to practice within the defined field; the technics practiced within the field shall be adequate to care for the majority of cases within the field defined; it shall be a field in which knowledge of the entire range of possibilities is a basic qualification and in which only the unusual case calls for special technics not included within the definition and where the practitioner within the field is required to be competent to decide upon the need for special technics.

(2) The definition which is included for the specialty shall be stated so as to delineate accurately the scope of practice properly embraced by the specialty.

Sec. b. To advise the specialty certifying boards with reference to defining and determining the scope of the several accepted specialties.

Sec. c. To advise the specialty certifying boards with reference to establishing appropriate standards of education and training for the several specialties and coordinating the requirements for certification by the certifying boards.

Sec. d. To advise the certifying boards in reference to the development of an appropriate modus operandi for determining fitness of applicants for certification.

Sec. e. To receive from the certifying boards proposals relating to their organization and activities and transmit these with appropriate recommendations to the Board of Trustees of the American Osteopathic Association.

Sec. f. To provide for the certification of applicants in distinct and recognized specialties in which there is no organized specialty society in the profession and no certifying board.

Sec. g. To review the proposals for certification received from the certifying boards and make recommendations concerning each proposal to the Board of Trustees of the American Osteopathic Association for its action.

Sec. h. To maintain contact with the activities of the certifying boards in order to ascertain their conformity to the standards and procedures adopted and to advise them when indicated regarding corrections in their procedures. If necessary, the Advisory Board shall make appropriate recommendations to the Board of Trustees of the American Osteopathic Association when any certifying board persists in failing to conduct its affairs in an acceptable manner.

Sec. i. To cooperate with the Executive Secretary of the American Osteopathic Association in maintaining an accurate listing of certified specialists in good standing.

Sec. j. To assist in educating the profession at large concerning the significance of specialty certification and its relation to the general practitioner.

Sec. k. To respond in an advisory capacity to any group within the profession in matters pertaining to the recognition or declaration of specialization.

Sec. l. To cooperate with the Bureau of Professional Education and Colleges, the Bureau of Hospitals, and the American Osteopathic Association in creating and standardizing specialty training programs and in establishing the principle of certification in the personnel of the organizations coming under its jurisdiction.

Sec. m. To keep a record of all meetings, transactions, and actions of the Advisory Board and maintain in an appropriate form a cumulative compilation of recommendations of this Board to the Board of Trustees of the American Osteopathic Association.

The original stenographic notes of the proceedings of the Advisory Board shall be filed as the legal record of the minutes of the Advisory Board. The edited minutes shall be considered legal after approval by the Advisory Board except in instances of question as to original intent and purpose, when the original record shall become a part of the final document of record.

Sec. n. To establish and maintain a file of the constitutions and bylaws of all approved certifying boards together with their amendments, cumulative lists of their memberships, cumulative lists of those certified by each certifying board, and record the standing of each certificate holder.

ARTICLE III—MEMBERSHIP

Sec. a. The membership of the Advisory Board for Osteopathic Specialists shall consist of those designated ex-officio members together with the secretary-treasurers of the several approved certifying boards and one other appointed representative from each of the certifying boards and representatives from each of the following groups as indicated below, appointed by its chairman or president:

(1) Board of Trustees of the American Osteopathic Association—two representatives.
(2) Bureau of Professional Education and Colleges—two representatives.
(3) Bureau of Hospitals—two representatives.
(4) American Association of Osteopathic Colleges—two representatives.
(5) Central Office—American Osteopathic Association—one representative. The Executive Secretary of the American Osteopathic Association shall appoint one osteopathic physician from Central Office to serve as a member of the Advisory Board.

Sec. b. Member organizations shall make their appointments within 60 days following each annual meeting of the American Osteopathic Association and the appointments shall be communicated promptly to the Executive Secretary of the American Osteopathic Association and to the Secretary of the Advisory Board.

Sec. c. Each member organization is entitled to two votes, but in no case may a member organization be entitled to vote without a duly authorized representative being present. Both votes may be cast by one representative in the absence of the other. The representative of the Central Office shall have no vote.

Sec. d. Alternates may be accepted as members if they are designated by the appropriate member organization officer and their names are in the hands of the Executive Secretary of the American Osteopathic Association and the Secretary of the Advisory Board for Osteopathic Specialists before the time of the annual meeting of the Advisory Board.

Sec. e. When one individual is named by two different member organizations as a representative, the appointing officer whose appointment was last received shall be informed of the previous appointment of the individual by another member organization so that his appointment may be changed if desired.

Sec. f. When an ex officio member of the Advisory Board is appointed as a representative of a member organization, he shall vote in the capacity as such a representative. If he is an Advisory Board member ex officio only, he may vote as an individual.

Sec. g. Any organization which holds membership on the Advisory Board and which does not have its representatives in attendance for two consecutive years shall have its membership on the Advisory Board revoked.

ARTICLE IV—OFFICERS

Sec. a. The officers of this Board shall be Chairman, Vice-Chairman, and Secretary.

Sec. b. The Chairman shall be elected at each alternate annual meeting for a term of 2 years from those who are members at the time of election.

In the event of his not being a member of the Advisory Board under the provisions of Article III, Sec. a, during the period for which he is elected, he shall continue a member for the term of his office.

He shall appoint all committees, excepting as otherwise provided, serve as an ex-officio member of all standing committees, make the prescribed reports, preside at all meetings of the Advisory Board, act as Chairman of the Executive Committee, and perform such other duties as customarily reside in the office.

He shall make an annual and a midyear report of the Advisory Board's activities to the Board of Trustees of the American Osteopathic Association.

Sec. c. The Vice-Chairman shall be elected at each alternate annual meeting for a term of 2 years from those who are members at the time of the election.

He shall be a member of the Advisory Board at the time of his election and shall be a member ex officio during the term for which he is elected.

He shall perform the duties customarily resident in this office.

Sec. d. The Secretary shall be elected every third year for a term of 3 years from those who are members at the time of the election.

He shall be a member of the Advisory Board ex officio during the term for which he is elected.

He shall keep a record of all meetings, transactions, and actions of the Advisory Board and assist the Chairman in such other duties as are appropriate to this office.

Sec. e. In the event of a vacancy in the office of the Chairman and Vice-Chairman, the senior member of the two members at large elected to the Executive Committee, shall act as Chairman until the next regular meeting.

ARTICLE V—COMMITTEES

Sec. a. The Executive Committee shall be composed of the Chairman, Vice-Chairman, Secretary, and two members of the Advisory Board.

One such member from the Advisory Board shall be elected each year for a term of 2 years.

Elected members of the Executive Committee shall be members ex officio of the Advisory Board through the terms for which they are elected.

This committee shall carry out the policy and activity initiated or decided by the Advisory Board. The Executive Committee shall meet on call of the Chairman.

The Executive Committee shall act for the Advisory Board between meetings of the Advisory Board. All actions of the Executive Committee shall be subject to approval of the Board of Trustees of the American Osteopathic Association.

Sec. b. A Review Committee composed of three members shall be appointed by the Chairman not later than 30 days before the time of the annual meeting, or special meeting, from among members who affirm their intent to be in attendance at the meeting. This committee shall review the data supporting the proposals for certification submitted by the certifying boards and make recommendations to the Advisory Board concerning the proper action on each candidate proposed.

Names of the candidates who fail to meet the requirements of the Review Committee shall not be presented to the Advisory Board.

Sec. c. A Nominating Committee composed of three members shall be appointed by the Chairman at the time of the annual meeting to name candidates for officers for the ensuing year and to report to the last session of the meeting, at which time election of officers shall take place. Nominations from the floor will be in order.

Sec. d. An Appeal Committee shall be selected and appointed by the Chairman of the Advisory Board, with the approval of the Executive Committee whenever it is deemed necessary by the Chairman of the Advisory Board to provide for adjudication of a charge filed with the Advisory Board of unfairness or improper conduct of the affairs of any certifying board by an applicant for certification.

The Appeal Committee shall be composed of five members, who shall elect their own chairman, one individual to be appointed from the Bureau of Professional Education and Colleges; one from the Bureau of Hospitals; one from the Board of Trustees of the American Osteopathic Association; and two from the membership of the Advisory Board for Osteopathic Specialists, no one of whom shall be a member of the certifying board which is the object of complaint.

All appeals shall be filed with the Chairman of the Advisory Board not later than April 1. Copies of the written appeal and submitted material shall be provided to the Committee at least 30 days prior to its next scheduled meeting.

The meeting, or meetings, of the committee shall be arranged by the Chairman of the Appeal Committee with the complainant and a representative appointed by the chairman of the certifying board involved. A stenotype record of the proceedings shall be made, and such notes shall be confidential.

After hearing and considering the presentation of the complaint and the certifying board's response giving reasons for the action against which the complaint is directed, and after making any necessary investigation, the Appeal Committee shall make a report to the Advisory Board for Osteopathic Specialists, indicating what the Committee considers to be the proper action to be followed by the parties concerned. If the controversy is not suitably adjudicated and the circumstances justify, the report of the Appeal Committee shall be presented to the Board of Trustees of the American Osteopathic Association for further action.

This committee shall be dissolved upon conclusion of the duties specified above.

Sec. e. A Committee on Basic Documents shall be appointed by the Chairman of the Advisory Board for Osteopathic Specialists at each annual meeting. For the purposes of this Committee, the basic documents shall be defined as the Constitution and Bylaws, Regulations and Requirements of the specialty certifying boards, and the Manual of Procedure for the Advisory Board for Osteopathic Specialists and Boards of Certification.

The duties of this committee shall be:

(1) To maintain a file of all basic documents of the Advisory Board and its member certifying boards.

(2) To prepare and submit to the Advisory Board amendments to the Manual of Procedure for the Advisory Board for Osteopathic Specialists and Boards of Certification.

(3) To review the basic documents of the specialty certifying boards and recommend proposed changes in these documents as may be necessary to establish conformity with the Manual of Procedure for the Advisory Board for Osteopathic Specialists and Boards of Certification, as approved by the Board of Trustees of the American Osteopathic Association.

ARTICLE VI—MEETINGS

Sec. a. A regular annual meeting shall be held at the time and place of the annual convention of the American Osteopathic Association. The meeting shall be scheduled at such time that recommendations from this Advisory Board may be transmitted to the Board of Trustees of the American Osteopathic Association before the conclusion of its final sessions. The time and place of the sessions of the Advisory Board's meeting shall be communicated to all members not less than 30

days before the date of convening.

Sec. b. A quorum at any session of any regular meeting shall consist of a majority of the designated membership of the Advisory Board, and at least one-third of the member organizations shall be represented.

Sec. c. Robert's Rules of Order shall be followed except where they conflict with these rules of procedure.

Sec. d. The order of business shall be as follows:

(1) Call to order.
(2) Roll call.
(3) Secretary's report including:
  (a) Presentation of the report to the Board of Trustees of the American Osteopathic Association made at the preceding annual meeting.
  (b) Presentation of the Chairman's preliminary report to the Board of Trustees of the American Osteopathic Association, and the recommendations for the current session of the Advisory Board.
(4) Appointment of Nominating Committee.
(5) Reports and recommendations of certifying boards.
(6) Reports of standing committees.
(7) Reports of special committees.
(8) Unfinished business.
(9) Receipt of communications.
(10) Report of Review Committee.
(11) New business and assignments to appropriate committees.
(12) Report of Nominating Committee and election of officers.
(13) Appointment of committees for ensuing year.
(14) Adjournment.

ARTICLE VII—AMENDMENTS

Sec. a. Amendments to these Rules of Organization and Procedure may be adopted for submission to the Board of Trustees of the American Osteopathic Association for approval by the vote of a majority of the members of the Advisory Board registered with the Secretary as present at the annual meeting, provided the proposed amendment has been submitted to each member present in writing or printed form not less than 12 hours preceding the time of the meeting at which the vote is to be taken.

Sec. b. A Manual of Procedure for the Advisory Board for Osteopathic Specialists and Boards of Certification shall be issued by Central Office within 90 days following adoption of this recommendation by the Board of Trustees. It shall contain the following:

(1) Rules of Organization and Procedure of the Advisory Board for Osteopathic Specialists as amended with the approval of the Advisory Board and the Board of Trustees.

(2) Rules of Procedure for specialty certifying boards as amended with the approval of the Advisory Board and Board of Trustees.

(3) Standard Constitution and Bylaws of Boards of Certification as approved by the Board of Trustees.

(4) Model form for Regulations and Requirements of Boards of Certification.

(5) Model form Outline for Annual Report of Secretaries of Certifying Boards to the Advisory Board.

Sec. c. The documents listed under Section b above shall be edited, rearranged, and revised, without changing the intent, to provide better phraseology and continuity. Repetitions shall be deleted.

Sec. d. Three hundred copies of the Manual shall be issued. They shall be distributed to the Executive Committee of the American Osteopathic Association, officers and members of boards of certification, and to other individuals who have a right to the Manual.

Sec. e. The Manual shall be revised every 2 years, and the revisions shall include recommendations of the Advisory Board which have been approved by the Board of Trustees since the preceding issue of the Manual pertaining to the conduct of the Advisory Board, boards of certification, and applicants for certification.

Sec. f. All recommendations which amend or in any way alter any of the documents reproduced in the Manual shall be presented as amendments with proper reference to the document, article, section, and paragraph.

Boards of Specialty Certification

STANDARD CONSTITUTION AND BYLAWS

(Approved by the Board of Trustees of the American Osteopathic Association, July, 1948)

CONSTITUTION
of the
AMERICAN OSTEOPATHIC BOARD OF.....

ARTICLE I—NAME

The name of this organization shall be The American Osteopathic Board of .....

ARTICLE II—PURPOSE

Sec. 1. The purposes of this Board shall be:

(a) To define the qualifications to be required of osteopathic physicians for certification in the field (or fields) of ..... and of any other specialty field that may be assigned to this Board.

(b) To determine the qualifications of osteopathic physicians as specialists for certification in the field (or fields) of ..... and of any other specialty field that may be assigned to it.

(c) To conduct examinations in conformity with the Bylaws of this Board.

(d) To issue certificates, subject to the recommendation of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association, to those physicians who are found qualified.

(e) To recommend revocation of certificates for cause.

(f) To use every means possible to maintain a high standard of practice in these specialties (this specialty) within the osteopathic profession.

The actions of the American Osteopathic Board of ..... are subject to the recommendation of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association.

ARTICLE III—DEFINITION

Sec. 1. For the purpose of the operation of this Board the following division(s) of practice is (are) defined:

(a) The practice of ..... shall consist of and include .....

.....

(b) The practice of ..... etc., etc.

ARTICLE IV—ORGANIZATION

Sec. 1. Membership.

(a) The American Osteopathic Board of ..... shall consist of ..... members elected by .....

.....

Each elected member shall be a certified specialist in good standing in .....

(Each specialty group shall be represented in the membership of the Board .....) Insofar as possible there shall be a representative from each geographical time belt of the United States on this Board.

(b) Members shall be elected for a term of 3 years (except that at the first election of members to this Board three members shall be elected for 3 years, three shall be elected for 2 years, and three for 1 year. Thereafter, three members shall be elected annually for the full term of 3 years.) The terms of members should be so staggered that the new members elected in any year shall not constitute a majority of the Board. In case of death or resignation of any Board member, ... shall appoint a certified specialist from the corresponding field to fill the unexpired portion of the term.

(c) Members shall continue to serve until their successors are elected.

Sec. 2. Officers.

(a) The officers of this Board shall be:

(i) Chairman.

(ii) Vice-Chairman.

(iii) Secretary-Treasurer.

(b) These officers shall be elected by this Board for a term of 1 year at its annual meeting.

(c) Officers shall continue to hold office until their successors are elected.

Sec. 3. Committees.

(a) There shall be three standing committees of this Board and such other committees as may from time to time be authorized. The Chairman shall appoint all committees unless it is otherwise provided.

(b) The standing committees shall be:

(i) Credentials Committee.

(ii) Examination Committee.

(iii) Advisory Board Committee.

ARTICLE V—AMENDMENT

Sec. 1. Subject to the review and recommendation of the Advisory Board for Osteopathic Specialists and the approval of the Board of Trustees of the American Osteopathic Association this Constitution may be amended by a vote of two thirds of the total membership of this Board (or three fifths in a five-member Board) at any annual meeting following notification given at any previous annual meeting of such intention.

BYLAWS
of the
AMERICAN OSTEOPATHIC BOARD OF.....

ARTICLE I

DUTIES OF THE AMERICAN OSTEOPATHIC BOARD OF

.....

Sec. 1. This Board shall serve as an advisory body to all applicants for certification in the specialty (specialties) of ..... and any other specialty which may be assigned to its jurisdiction.

Sec. 2. This Board shall determine, in accordance with the provisions of these Bylaws, the appropriate standards of education and the training held necessary for certification in the specialty (specialties) of ..... and of any other specialty which may be assigned to its jurisdiction, subject to the recommendations of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association.

Sec. 3. This Board shall establish detailed rules for conducting all examinations in compliance with the provisions of these Bylaws and shall provide for the conduct of examinations at least once a year in accordance with its Regulations and Requirements.

Sec. 4. This Board shall file with the Advisory Board for Osteopathic Specialists, at the time specified by the Advisory Board, its recommendations concerning each applicant for certification together with any pertinent information required by the Advisory Board for Osteopathic Specialists.

Sec. 5. This Board shall provide and issue certificates in all fields assigned to this Board's jurisdiction, as provided in Article V of these Bylaws.

Sec. 6. This Board shall provide permanent files for all records. It shall record and keep permanently on file all applications submitted to it and complete records of examination results and shall maintain a registry of certificate holders. All examination papers and case reports of applicants shall be kept on file for a period of 3 years.

Sec. 7. This Board shall levy and collect from applicants the funds necessary to finance the operation of this Board as provided in the Regulations and Requirements.

Sec. 8. This Board shall arrange for all meetings necessary to enable this Board to carry out its functions as provided in Article VI, Sections 1 and 2 of these Bylaws.

Sec. 9. This Board shall provide two members of this Board to function as representatives to the Advisory Board for Osteopathic Specialists. One of the two members shall be the Secretary-Treasurer. In case of inability of the regular representatives to attend the sessions of the Advisory Board for Osteopathic Specialists, the Chairman of this Board shall appoint alternates as provided in the Rules of Organization and Procedure of the Advisory Board for Osteopathic Specialists.

Sec. 10. This Board shall conduct its activities in relation to the officers of the American Osteopathic Association, the Advisory Board for Osteopathic Specialists, other certifying boards, and applicants for certification as provided in the Rules of Procedure for Specialty Certifying Boards compiled by the Advisory Board for Osteopathic Specialists and approved by the Board of Trustees of the American Osteopathic Association.

Sec. 11. This Board shall make, in conformity to its Constitution and Bylaws, all necessary regulations and requirements to govern its activities which are not provided by the Advisory Board for Osteopathic Specialists and the Board of Trustees of the American Osteopathic Association.

ARTICLE II—COMMITTEES

Sec. 1. Credentials Committee.

(a) There shall be a Credentials Committee of ..... members appointed by the Chairman of this Board, whose members shall represent different geographical districts so far as possible.

(b) It shall be the duty of the Credentials Committee:

(i) to receive all completed applications from the Secretary-Treasurer;

(ii) to conduct a comprehensive investigation of each applicant in accordance with the rules governing application;

(iii) to prepare a recommendation concerning each applicant and present this to the American Osteopathic Board of ..... at its next (annual) meeting.

Sec. 2. Examination Committee.

(a) There shall be an Examination Committee composed of the Chairman of this Board and not less than two additional Board members. The Chairman of this Board shall act as the Chairman of the Examination Committee.

(b) It shall be the duty of the Examination Committee to plan and to make preparations for the conduct of examinations in the special fields coming under the jurisdiction of this Board in accordance with the rules governing examinations as stated in Article IV, Section 1, Paragraph (h) of these Bylaws and in the Regulations and Requirements of this Board.

(c) The Examination Committee shall report to this Board the findings on the examination of each applicant.

Sec. 3. Advisory Board Committee.

(a) There shall be an Advisory Board Committee consisting of the Chairman and the Secretary-Treasurer of this Board.

(b) It shall be the duty of the Advisory Board Committee to represent the American Osteopathic Board of ..... in all matters where such representation is required.

(c) The Chairman shall annually appoint as an alternate member of this Committee a member of the Board of..... who shall be empowered to act for either regular member who is not in attendance.

ARTICLE III—DUTIES OF OFFICERS

Sec. 1. The duties of the Chairman shall be:

(a) to preside at all meetings;

(b) to appoint all committees and representatives to the Advisory Board for Osteopathic Specialists;

(c) to schedule meetings of this Board at such times and places as necessary to carry on the business of this Board;

(d) to supervise all examinations;

(e) to act as an ex officio member of all committees;
(f) to sign all certificates issued by this Board;
(g) to act as Chairman of the Examination Committee;
(h) to be a member of the Advisory Board Committee.

Sec. 2. The duties of the Vice-Chairman shall be:
(a) to assume the duties of the Chairman when the latter is absent or otherwise unable to fulfill them;
(b) to assist the Chairman in the discharge of his duties.

Sec. 3. The duties of the Secretary-Treasurer shall be:
(a) to keep on permanent file records of all proceedings, transactions, and rulings of this Board, and to keep on file all examination papers and case records for a period of 3 years;
(b) to have printed and distributed all certificates, application forms, circulars of information, etc., authorized by this Board and necessary for the proper functioning of this Board;
(c) to maintain in proper place and form the moneys of this Board and to issue an accounting of them at annual meetings or at such other times as requested by the Chairman of this Board;
(d) to keep a permanent file of all applications coming before this Board with a signed record of the action taken on each;
(e) to maintain a record of all certificate holders in good standing and to supply upon request to governmental agencies, hospitals, physicians, schools, and others entitled to such information, a list of holders of certificates in good standing;
(f) to have prepared in appropriate and complete form for presentation to the Review Committee of the Advisory Board for Osteopathic Specialists in support of recommendations for certification the application, examination record (written, oral, and practical), and other pertinent information requested; (See Rules of Procedure.)
(g) to serve as a representative of this Board to the Advisory Board for Osteopathic Specialists;
(h) to sign all certificates issued by this Board, as provided in Article V;
(i) to prepare an annual report in keeping with the Rules of Procedure for Specialty Certifying Boards of the work done by this Board, including a list of all applicants and the results of their examinations and a resume of the Board's finances. This report is to be presented at the annual meeting of the Advisory Board for Osteopathic Specialists and copies are to be supplied to the Chairman and Secretary of the Advisory Board and to the Executive Secretary of the American Osteopathic Association;
(j) to cooperate with the Executive Secretary of the American Osteopathic Association in all matters pertaining to the annual registration of certificate holders;
(k) to notify the Executive Secretary of the American Osteopathic Association and the Chairman and Secretary of the Advisory Board for Osteopathic Specialists of members and officers elected to this Board and of appointments to the Advisory Board for Osteopathic Specialists.

ARTICLE IV—REQUIREMENTS FOR CERTIFICATION

Sec. 1. To be eligible to receive a certificate of specialization from the American Osteopathic Board of ..... the applicant must meet all of the following minimum requirements, excepting as provided in Section 3 (and Section 4) of this Article:
(a) He must be a graduate of an approved osteopathic college.
(b) He must be licensed to practice in the state or territory where he conducts his specialty practice.
(c) He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination by this Board.
(d) He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.
(e) He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.
(f) A period of not less than 3 years of special training related to the specialty shall be required, after the required 1 year of internship, or its equivalent, but not necessarily running 3 consecutive years. This Board may modify the requirement of 3 years' special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement, for physicians who graduated prior to 1946, but in no case may such applicant be accepted for examination without at least 1 year of special training as defined. This training shall include:

(i) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

(ii) Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above, as determined by this Board. It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

(g) He must practice as a specialist in his field for a period of at least 2 years subsequent to the minimum 3 years of special training. Specialty practice within each specialty field under this Board shall be defined in the Regulations and Requirements of this Board.

(h) Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the current advances in the specialty, and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board may conduct the oral and written examinations at the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty. A full description of the method of conducting the examination shall be formulated in this Board's Regulations and Requirements, and provision for re-examination shall be made.

(i) Applicants desiring examination for certification shall be required to file an application which shall set forth the applicant's qualifications for examination as stated in paragraphs (a), (b), (c), (d), (e), (f), and (g) above. The procedure for filing applications shall be set forth in the Regulations and Requirements and no application for action at any annual meeting of this Board shall be accepted after April 1st of that year.

Sec. 2. In the case of any applicant who was engaged in the practice of his specialty by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general re-

quirements stated in Section 1, (a), (b), (c), (d), and (e) above, and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature or otherwise has indicated his consistent interest and competence in his specialty, the requirements of this Article IV, Section 1, paragraphs (f) and (h) may be waived and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

Sec. 3. Subject to the recommendations of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association, the American Osteopathic Board of ..... may require such further training in each of the specialty fields coming under its jurisdiction as in its judgment such field may require, provided that the additional requirements for each specialty field are clearly set forth in the Regulations and Requirements of this Board. Additions to requirements shall not go into effect until 1 year subsequent to the announcement of such change.

Sec. 4. If circumstances necessitate it, a section may be written and inserted at this point to provide for the fair handling of applicants already acting on the basis of commitments made by this Board prior to 12-15-46.

ARTICLE V—CERTIFICATES

Sec. 1. Issuance.

Certificates of specialization which have been approved by the Board of Trustees of the American Osteopathic Association shall be issued by the American Osteopathic Board of ..... to applicants who have conformed to all requirements for certification described in Article IV of these Bylaws and who have received the recommendation of the Advisory Board for Osteopathic Specialists and the approval of the Board of Trustees of the American Osteopathic Association. Each such certificate shall be signed by the Chairman and the Secretary-Treasurer of this Board. No certificate is valid until it has been signed by the Executive Secretary of the American Osteopathic Association.

Sec. 2. No certificate shall be issued to an individual who is certified by another board, until the former certificate has been surrendered to the Executive Secretary of the American Osteopathic Association.

Sec. 3. Revocation.

This Board shall have the power to recommend to the Advisory Board for Osteopathic Specialists and the Board of Trustees of the American Osteopathic Association the revocation of the certificate of any holder whose certificate was obtained by fraud or misrepresentation, who unduly advertises, exploits his certificate, violates the Code of Ethics of the American Osteopathic Association, or otherwise disqualifies himself.

Sec. 4. To remain in good standing the certificate holder shall pay an annual registration fee to the Executive Secretary of the American Osteopathic Association, as provided in the Rules of Procedure for Specialty Certifying Boards, as compiled by the Advisory Board for Osteopathic Specialists.

ARTICLE VI—MEETINGS

Sec. 1. The American Osteopathic Board of ..... shall hold a regular annual meeting to transact business and to conduct examinations at the time and place of the annual meeting of the American Osteopathic Association (or at the annual meeting of its respective specialty college).

Sec. 2. Special meetings of this Board which are deemed necessary for the transaction of business may be called with the approval of the majority of the members of this Board provided all members are formally notified of the called meeting and its purpose, not less than 30 days before the date set for the meeting.

Sec. 3. For the transaction of business at any meeting of this Board, ... members shall constitute a quorum.

ARTICLE VII—AMENDMENT

Sec. 1. Subject to the review and recommendation of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association, these Bylaws may be amended by a two-thirds vote of the total membership of this Board (or three-fifths in a five-member Board) at any meeting provided each member has been notified at least 30 days prior to the date of the meeting of its being called and of the intention to amend.

AMERICAN OSTEOPATHIC BOARD OF ANESTHESIOLOGY

K. George Tomajan, Chairman, Boston, Massachusetts
J. Calvin Geddes, Vice Chairman, Mount Clemens, Michigan
Mahlon L. Ponitz, Detroit, Michigan
Claire E. Pike, Long Beach, California
J. Maurice Howlett, Birmingham, Michigan
J. Craig Walsh, Philadelphia, Pennsylvania
Crawford M. Esterline, Secretary-Treasurer, Kirksville, Missouri

DEFINITION OF SPECIALTY PRACTICE

For the purpose of the operation of this Board the following division of practice is defined:

a. The practice of anesthesiology shall consist of and include that branch of medical science, art, and practice which deals with the use of anesthetic agents, the evaluation of the patient's condition with reference to the use of anesthetic agents and the care of complications incident to their use.

REQUIREMENTS FOR CERTIFICATION

To be eligible to receive a certificate of specialization from the American Osteopathic Board of Anesthesiology, the applicant must meet all of the following minimum requirements:

1. He shall have graduated from an approved osteopathic college at least 6 years prior to consideration of his application by this Board.

2. He shall be licensed to practice in the state or territory where he conducts his specialty practice.

3. He shall have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to making application for examination by this Board.

4. He shall be, and if certified continue to be, favorably known and recognized by his clientele as an osteopathic physician who is specializing in the practice of anesthesiology and shall publicize his osteopathic affiliations in an ethical manner.

5. He shall be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

6. He shall have had an internship of at least 1 year in a hospital acceptable to this Board. The intern year of 9 months as prescribed by the Selective Service Board during World War II shall be acceptable. For physicians who graduated in 1942 or prior thereto, this Board may accept other qualifications in lieu of internship where the applicant's anesthetic experience and ability are beyond question.

7. He shall provide notarized documentary evidence of a minimum of 3 years of formal training subsequent to his internship (or its equivalent). This formal training program must be acceptable to this Board and shall include:

a) A period of at least 1 year of formal training in anesthesiology in a hospital acceptable to this Board and made up of either:

i) an approved residency;
or
ii) an approved full-time preceptorship training program.

b) A period of at least 2 years' special training in anesthesiology subsequent to the required 1 year of internship and the required 1 year of formal training. This special training may be made up, either in whole or in part, of:

i) an approved residency;
ii) approved preceptorship training. Approved preceptorship training programs may be either full-time or part-time. Two years of approved part-time preceptorship training shall be the equivalent of 1 year of full-time preceptorship training.

After the completion of the required 1 year of internship (or its equivalent), the required 1 year of formal training, and 1 year of the required 2 years of special training in anesthesiology, this Board may, at its discretion, accept 2 years of recognized specialty practice in anesthesiology as the equivalent of the third year of special training. In each year of specialty practice, the applicant must have administered at least 250 anesthetics of a diversified nature.

During the minimum 3-year period of formal training, there shall be evidence of sufficient clinical work in anesthesiology with a minimum of 250 anesthetics of a diversified nature administered annually.

For applicants who graduated in 1947 or prior thereto, in lieu of requirement No. 7, Item b), this Board may, at its discretion, accept 2 years of recognized specialty practice in anesthesiology, subsequent to the required 1 year of internship (or its equivalent), and the required 1 year of formal training, as the equivalent of 1 year of special training or 4 years of recognized specialty practice in anesthesiology as the equivalent of 2 years of special training. In each year of specialty practice, the applicant must have administered at least 250 anesthetics of a diversified nature.

8. He shall provide evidence to this Board that he has received satisfactory postgraduate training in the basic sciences, including anatomy, physiology, biochemistry, pathology, toxicology, and pharmacology.

The applicant who began a specialty training program in anesthesiology after January 1, 1951, and who has pursued a training program in anesthesiology other than a residency approved by the Board of Trustees of the American Osteopathic Association shall provide evidence to this Board that he has received satisfactory postgraduate training in the basic sciences, including anatomy, physiology, biochemistry, pathology, toxicology, and pharmacology.

A minimum of 100 clock hours shall be required in the basic science training programs, subdivided as follows:

a) A minimum of 10 clock hours each in the following subjects: anatomy, physiology, biochemistry, pathology, toxicology, and pharmacology.

b) The remainder of the minimum required hours may be taken in any of the subjects mentioned or in other basic sciences related to the specialty of anesthesiology.

Those applicants who qualify must submit acceptable documentary evidence, which may be further investigated at the discretion of this Board, of having pursued this advanced training in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board.

9. He shall provide evidence that he has practiced the specialty of anesthesiology for a period of at least 2 years subsequent to the completion of the required minimum of 3 years of formal training, or its equivalent, prior to being examined.

10. He shall provide evidence that he has administered a minimum of 1,250 anesthetics of a diversified nature.

11. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

12. He shall present detailed case records, acceptable to this Board, of 25 major anesthetic procedures, using an outline furnished by this Board, which correlates the principal details of preoperative examination, the reasons for selection and utilization of the anesthetic agents, operative and postoperative conduct of the anesthesia.

13. He shall submit complete anesthetic case records and a report of pertinent factors where fatalities resulted within 24 hours in all patients anesthetized by the applicant during the 12-month period immediately prior to making application for examination by this Board.

14. He shall submit a list of the anesthetics administered by him for the 12-month period immediately prior to making application, naming the type of operation, the hospital in which the operation was performed, the patient's initials, the hospital case number, the name of the surgeon, the anesthetics administered, and the case termination. This list shall be certified by the administrator of the hospital in which the anesthetics were administered.

15. He shall submit a segregated total of all anesthetics administered in the 3-year period prior to making application, thereby showing the variety of agents and methods of anesthesia.

16. In the case of any applicant who was engaged in the practice of anesthesiology by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements stated in Article IV, Section 1, a), b), c), d), and e) of the Bylaws, and who has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature or otherwise has indicated his consistent interest and competence in the field of anesthesiology, the requirements of Article IV, Section 1, f) and h) of the Bylaws may be waived and the applicant may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

AMERICAN OSTEOPATHIC BOARD OF DERMATOLOGY

Ronald W. MacCorkell, Chairman, Los Angeles, California
Edwin H. Cressman, Vice Chairman, Philadelphia, Pennsylvania
Anthony E. Scardino, Kansas City, Missouri
Cecil D. Underwood, Los Angeles, California
James D. Stover, Secretary-Treasurer, Detroit, Michigan

DEFINITION OF SPECIALTY PRACTICE

For the purpose of the operation of this Board the following divisions of practice are defined:

a. The practice of dermatology shall consist of and include the diagnosis and the surgical and nonsurgical management of the diseases of the skin and its appendages.

b. The practice of syphilology shall consist of and include the diagnosis and the surgical and nonsurgical management of syphilis in all its phases and stages.

c. A specialty practice, as defined by this Board, shall consist of not less than 90 per cent dermatology and syphilology.

REQUIREMENTS FOR CERTIFICATION

Section 1. To be eligible to receive a certificate of specialization from the American Osteopathic Board of Dermatology, the applicant must meet all of the following minimum requirements, excepting as provided in Section 2 of this Article:

(a) He must be a graduate of an approved osteopathic college.

(b) He must be licensed to practice in the state or territory where he conducts his specialty practice.

(c) He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination by this Board.

(d) He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.

(e) He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

(f) A period of not less than 3 years of special training related to the specialty shall be required, after the required 1 year of internship, or its equivalent, but not necessarily running 3 consecutive years. This Board may modify the requirement of 3 years' special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement, for physicians who graduated prior to 1946, but in no case may such applicant be accepted for examination without at least 1 year of special training as defined. This training shall include:

(i) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

(ii) Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to, or studying under the preceptorship of, a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above, as determined by this Board. It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

(g) He must practice as a specialist in his field for a period of at least 2 years subsequent to the minimum 3 years of special training. Specialty practice within each specialty field under this Board shall be defined in the Regulations and Requirements of this Board.

(h) Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the current advances in the specialty, the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board may conduct the oral and written examinations at the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty. A full description of the method of conducting the examination shall be formulated in this Board's Regulations and Requirements, and provision for re-examination shall be made.

(i) Applicants desiring examination for certification shall be required to file an application which shall set forth the applicant's qualifications for examination as stated in paragraphs (a), (b), (c), (d), (e), (f), and (g) above. The procedure for filing applications shall be set forth in the Regulations and Requirements and no application for action at any annual meeting of the Board shall be accepted after April 1st of that year.

Section 2. In the case of any applicant who was engaged in the practice of his specialty by 1939 or prior thereto, and who graduated prior to 1936 and who meets the general requirements stated in Section 1, (a), (b), (c), (d), and (e) above and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature or otherwise has indicated his consistent interest and competence in his specialty, the requirements of this Article IV, Section 1, paragraphs (f) and (h) may be waived, and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

Section 3. Subject to the recommendations of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association, the American Osteopathic Board of Dermatology may require such further training in each of the specialty fields coming under its jurisdiction as in its judgment such field may require, provided that the additional requirements for each specialty field are clearly set forth in the Regulations and Requirements of this Board. Additions to requirements shall not go into effect until 1 year subsequent to the announcement of such change.

AMERICAN OSTEOPATHIC BOARD OF INTERNAL MEDICINE

Basil Harris, Chairman, Los Angeles, California
Stuart F. Harkness, Vice-Chairman, Des Moines, Iowa
Neil R. Kitchen, Detroit, Michigan
John L. Crowther, Bangor, Maine
Maxwell R. Brothers, Los Angeles, California
G. A. Whetstine, Wilton Junction, Iowa
William F. Daiber, Philadelphia, Pennsylvania
Charles M. Worrell, Harrisburg, Pennsylvania
Glennard E. Lahrson, Secretary-Treasurer, Oakland, California

DEFINITION OF SPECIALTY PRACTICE

The practice of internal medicine is devoted primarily to the application of subjective, objective, and laboratory procedures in studying and evaluating the affections, diseases, and functional disorders of the circulatory, respiratory, digestive, endocrine, metabolic, musculoskeletal, hematopoietic, and eliminative systems of the human body to:

a. the correlation of data thus secured with clinical observations to reach diagnostic conclusions;
b. the management of cases within this field by the utilization of all nonsurgical measures;
c. assist in planning the therapeutic utilization of the technics of other specialty branches of medical and surgical practice in the care of patients.

The practice of internal medicine does not include the treatment of the organs of special sense or the organs of the reproductive system, except as to their endocrine relations, and excludes the use of instrumental procedures ordinarily performed by surgeons or surgical specialists.

REQUIREMENTS FOR CERTIFICATION

A. *Educational Qualifications.*—To be eligible to receive a certificate of specialization from the American Osteopathic Board of Internal Medicine the applicant must meet all of the minimum requirements as set forth in the Bylaws of the American Osteopathic Board of Internal Medicine, Article IV, Sections 1, 2, and 3.

The 3-year period of training related to the specialty as required in the Bylaws, Article IV, Section 1, (f) is further defined:

1. A period of not less than 3 years of special training related to this specialty shall be required, after the required 1 year of internship or its equivalent, but not necessarily running 3 consecutive years. This Board may modify the requirement of 3 years' special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement for physicians who graduated prior to 1946, but in no case may such applicant be accepted for examination without at least 1 year of special training as defined.

A year of special training shall be interpreted to mean 12 months; a training hour is interpreted to mean a platform hour. This training shall include:

1. Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

2. Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

3. To obtain a mature and comprehensive understanding of the Basic Sciences this Board recommends a minimum of 160 hours of basic science instruction on the graduate level, divided as follows:

Anatomy	30 hours
Physiology	37 hours
Pathology	37 hours
Biochemistry	15 hours
Bacteriology	20 hours
Pharmacology	21 hours

4. Didactic and clinical instruction to assure adequate training in this specialty is recommended in the various fields

of internal medicine totaling 320 hours. This instruction must include cardiology, electrocardiography, peripheral vascular diseases, medical diseases of the kidney, gastroenterology, metabolic diseases, endocrinology, hematology, clinical pathology, respiratory diseases, diseases of the biliary system, musculoskeletal system, x-ray interpretation, ophthalmoscopy, and osteopathic principles and therapeutics, including materia medica as these relate to internal medicine.

5. The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, which may include:

a. *Preceptorship.*—All preceptorship training programs must be approved by the Committee on Accreditation of Postgraduate Training and the Board of Trustees of the American Osteopathic Association on recommendation of this Board. The preceptorship training program shall be full time for a period of 3 years, but not necessarily running 3 consecutive years. The preceptorship training program shall be previously submitted to and approved by the Committee on Accreditation of Postgraduate Training of the American Osteopathic Association and the Board of Trustees of the American Osteopathic Association on recommendation of this Board. The preceptor and trainee must likewise be qualified and approved by the above agencies. The trainee shall not maintain an independent practice.

b. *Full-time Assistantship.*—The assistantship must extend for a minimum period of 3 years to a certified internist acceptable to this Board. A full explanation of the scope and diversity of practice, together with any other information that may be from time to time requested, shall be presented to this Board for approval.

c. *Residency.*—Full-time residency in internal medicine shall be in a hospital approved for resident training by the Bureau of Hospitals of the American Osteopathic Association. Appropriate credit toward the special training requirement of this Board shall be allowed for full-time approved residencies of 1, 2, or 3 years in internal medicine.

6. It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training. An affidavit shall be furnished upon the request of this Board.

B. *Membership Requirements.*—Membership qualifications are those as stated in the Bylaws of the American Osteopathic Board of Internal Medicine, Article IV, Section 1, (c).

C. *Graduation Requirements.*—The graduation requirements with exceptions are those as stated in the Bylaws of the American Osteopathic Board of Internal Medicine, Article IV, Section 2.

D. *Years of Specialty Practice Required.*—The applicant must have practiced as a specialist in the field of internal medicine for a period of at least 2 years subsequent to the minimum of 3 years of special training, as defined by this Board, before he is eligible for clinical examination.

E. *Percentage of Practice in Internal Medicine.*—The applicant is expected to have practiced according to the "Definition of the Practice of Internal Medicine" as printed in the Regulations and Requirements of the American Osteopathic Board of Internal Medicine, Part II, 1. An affidavit shall be furnished on request of the Board.

F. *Case Records.*—Specially prepared case records for presentation to this Board are not required, however, during the investigation by the Credentials Committee the applicant's office and/or hospital records shall be made available on request of the Committee. Such original records are not to be removed from the office or hospital.

G. *Copy of Published Articles.*—Authenticated copies of published articles are to be furnished on request of the Credentials Committee. No thesis is required.

H. *Privilege of Re-Examination.*—No applicant will be re-examined within a period of 1 year following an initial failure. Re-application will be necessary to retake the examination. If the applicant fails the second examination, a 2-year period of further special study and practice satisfactory to the American Osteopathic Board of Internal Medicine is required. A re-application will be necessary to retake the examination after the second failure.

AMERICAN OSTEOPATHIC BOARD OF NEUROLOGY AND PSYCHIATRY

K. Grosvenor Bailey, Chairman, Los Angeles, California
Cecil Harris, Vice Chairman, Philadelphia, Pennsylvania
Floyd E. Dunn, Kansas City, Missouri
Randall J. Chapman, Burbank, California
Thomas J. Meyers, Secretary-Treasurer, Pasadena, California

DEFINITION OF SPECIALTY PRACTICE

For the purpose of the operation of this Board, the following divisions of practice are defined:

a. The specialty of neurology shall consist of that division of the practice of osteopathic medicine embracing disorders of the organic nervous system. It shall include all diagnostic procedures and examination technics giving an understanding of the problems involved. Included will be conditions affecting the peripheral nerves, as well as the brain and central nervous system, the autonomic nervous system, and endocrine syndromes, and specific conditions such as epilepsy, migraine, tics, etc., are included. It does not include neurosurgery.

b. The specialty of psychiatry includes that division of the practice of osteopathic medicine involving functional and organic disturbances of the mind, emotions, and nervous system. It includes personality problems, addictions, behavior difficulties, insanities, marital problems, and sexual and social anomalies. It covers counseling and psychotherapy in all its aspects, as well as diagnostic methods leading to an understanding of the dynamics of the mind. It includes legal and child psychiatry and the field of psychosomatics. It includes electroshock, hydrotherapy, electronarcosis, and other physical modalities applied to the treatment of the mentally ill. It does not include neurosurgery.

c. The specialty of neurology and psychiatry includes all of the divisions of osteopathic medicine as combined with the definitions of the specialty of neurology and the specialty of psychiatry, as stated in a. and b. above.

Note: For the definition of neurosurgery and for the requirements, see American Osteopathic Board of Surgery.

REQUIREMENTS FOR CERTIFICATION

Sec. 1. To be eligible to receive a certificate of specialization from the American Osteopathic Board of Neurology and Psychiatry the applicant must meet all of the following minimum requirements, excepting as provided in Article IV, Section 3 and Section 4 of the Bylaws:

(a) He must have graduated from an approved osteopathic college.

(b) He must be licensed to practice in the state or territory where he conducts his specialty practice.

(c) He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination by this Board.

(d) He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.

(e) He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

(f) A period of not less than 3 years of special training related to the specialty shall be required, after the required 1 year of internship, or its equivalent, but not necessarily running 3 consecutive years. This Board may modify the requirement of 3 years' special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement, for

physicians who graduated prior to 1946, but in no case may such applicant be accepted for examination without at least 1 year of special training as defined. For certification in neurology and psychiatry, the training period shall be not less than 5 years. This training shall include:

(i) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

(ii) Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

The 3-year period of special training as required in Section 1, (f), above, is further defined:

1. For certification in Neurology the following shall be included in an acceptable training program, residency, or preceptorship:

The amount of time of training shall total 3 calendar years or 6,000 clock hours and shall include:

Basic Science	100 clock hours
Psychiatry and Psychology	500 clock hours
Neurological Surgery Observation	500 clock hours
Didactic Courses	500 clock hours

A maximum of 1,000 hours may be granted for case reports, 2 hours being allowed for each. A maximum of 500 such reports may be presented. Such reports may be considered if they are submitted in an approved form and signed by the preceptor. Each report must include sufficient information to adequately describe the problem, support of diagnosis, data for differential diagnostic study, an estimate of the prognosis, and a suggested plan of treatment. Clinical training shall include: Electroencephalography, electromyography, reactions of degeneration, neuro-ophthalmoscopy, spinal taps, cisternal puncture, encephalography, ventriculography, stellate ganglion blocks, angiography, myelography, and autopsy studies. The amount of clinical training shall be 3,400 clock hours. Furthermore, the clinical material utilized must include a sampling of: Degenerative diseases, traumatic conditions, convulsive disorders, infective and toxic problems, neoplasms of the nervous system, deficiency states, cerebro-vascular problems, and geriatric and pediatric neurology.

2. For certification in Psychiatry the following shall be included in an acceptable training program, residency, or preceptorship:

The amount of time of training shall total 3 calendar years or 6,000 clock hours and shall include:

Psychological Subjects, including Testing	500 clock hours
Neurology and Neurological Subjects	500 clock hours
Basic Science	100 clock hours

A maximum of 1,000 hours may be granted for case reports, 2 hours being allowed for each. A maximum of 500 such reports may be presented. Such reports may be considered if they are submitted in an approved form and signed by the preceptor. Psychoanalysis to which the applicant has submitted himself for treatment or for training will be credited for a maximum amount of 200 clock hours. The training program for certification in Psychiatry shall be primarily of a clinical nature and must be conducted as actual contact with patients under supervision. The full range of psychiatric conditions shall include: Functional psychotics, neuroses of all kinds, sexual aberrations, organic mental conditions, geriatric psychiatry, pediatric psychiatry, marital problems, neurologic psychiatry, psychosomatics, mental deficiency, epilepsy, narcolepsy, alcoholism, psychopathic personalities, syphilis of the nervous system, and legal psychiatry. In addition, the applicant shall acquire familiarity with the theory of Psychiatry and the technics of: Electro-shock treatment, physiotherapy in psychiatry, hydrotherapy in psychiatry, pharmacology in psychiatry, dietetics in psychiatry, occupational therapy, psychotherapy (at least an operational ability), hypnosis and suggestion, child guidance, marital counseling, elementary psychological testing, and psychiatric examination procedure. Only work done in clinically oriented disciplines will be credited. The policy of this Board is to scrutinize critically all preceptor training programs in psychiatry because of its limitations and its questionable value. Unapproved preceptor training programs will not be recognized by this Board. The minimum amount of clinical training shall be 3,400 clock hours.

3. For certification in Neurology and Psychiatry an acceptable training program shall consist of a minimum of 5 years' full-time training or a total of 10,000 clock hours. This training shall consist of 2 years devoted exclusively to the study of Neurology and 2 years devoted exclusively to the study of Psychiatry and 1 year of study which shall include material from both fields and the Basic Sciences.

A holder of a certificate in Neurology or a holder of a certificate in Psychiatry shall be required to complete a minimum of 2 years' additional training to qualify for a certificate in Neurology and Psychiatry. The required 2 years' additional training program must be approved by the American Osteopathic Board of Neurology and Psychiatry.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above, as determined by this Board. It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

(g) He must practice as a specialist in his field for a period of at least 2 years subsequent to the minimum 3 years of special training. At least 80 per cent of the applicant's practice must be in the specialty field.

(h) Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the current advances in the specialty and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board may conduct the oral and written examinations at the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty. A full description of the method of conducting the examination shall be formulated in this Board's Regulations and Requirements, and provision for re-examination shall be made.

Sec. 2. In the case of any applicant who was engaged in the practice of his specialty by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements stated in Section 1, (a), (b), (c), (d), and (e) above and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty, the requirements of Article IV, Section 1, paragraphs (f) and (h) may be waived, and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

Sec. 3. Subject to the recommendations of the Advisory Board for Osteopathic Specialists and to the approval of the Board of Trustees of the American Osteopathic Association, the American Osteopathic Board of Neurology and Psychiatry may require such further training in each of the specialty fields coming under its jurisdiction as in its judgment such field may

require, provided that the additional requirements for each specialty field are clearly set forth in the Regulations and Requirements of this Board. Additions to requirements shall not go into effect until 1 year subsequent to the announcement of such change.

AMERICAN OSTEOPATHIC BOARD OF OBSTETRICS AND GYNECOLOGY

Dorothy J. Marsh, Chairman, Glendale, California
Kenneth A. Scott, Vice Chairman, Providence, Rhode Island
Homer R. Sprague, Lakewood, Ohio
Arthur B. Funnell, Denver, Colorado
Harold C. Bruckner, Clio, Michigan
Charles J. Mount III, Burbank, California
A. J. Still, Flint, Michigan
Frank E. Gruber, Philadelphia, Pennsylvania
Jacquelin Bryson, Secretary-Treasurer, Denver, Colorado

DEFINITION OF SPECIALTY PRACTICE

a. Obstetrics: The practice of obstetrics shall be defined as the diagnosis and management of all states presented in cases of pregnancy from the time of conception through the postpartum period by use of any or all means excepting those involving laparotomy or vaginal cesarian section.

b. Gynecology: The practice of gynecology shall be defined as the diagnosis and treatment of diseases peculiar to the female, and because of the close relationship does not exclude affections of the mammary gland and urinary tract in the female, but does exclude all major surgical procedures.

(1) The surgical procedures included under Gynecology are:

(a) Cervical cautery, conization, and biopsy
(b) Endometrial biopsy
(c) Diagnostic dilatation and curettage
(d) Hysterosalpingographies and tubal insufflations
(e) Incision of superficial abscesses
(f) Biopsy and excision of superficial tumors of the vulva
(g) Female circumcision
(h) Breast biopsies

c. Obstetrical-Gynecological Surgery: The practice of obstetrical-gynecological surgery shall consist of and include that branch of medical science, art, and practice which is concerned with major operative procedures:

(1) Within the abdomen and pelvis upon the female generative system or structures related thereto;
(2) Major plastic procedures upon the vaginal tract by manual and instrumental means;
(3) And mammary gland.

REQUIREMENTS FOR CERTIFICATION

To be eligible to receive a certificate of specialization from the American Osteopathic Board of Obstetrics and Gynecology the applicant must meet all of the following minimum requirements:

a. He must be a graduate of an approved osteopathic college.

b. He must be licensed to practice in the state or territory where he conducts his specialty practice.

c. He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years prior to application for examination by this Board.

d. He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.

e. He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

f. A period of not less than 3 years of special training related to the specialty shall be required, after the required 1 year of internship, or its equivalent, but not necessarily immediately following the internship nor running 3 consecutive years, except that in the case of applicants who graduated prior to 1946, this Board may modify the requirement of 3 years of special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement, but in no case may such an applicant graduated prior to 1946 be accepted for examination without at least 1 year of special training as defined. This training shall include:

(i) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

A minimum of 100 clock hours shall be required in the basic science training programs, subdivided as follows:

(a) A minimum of 10 clock hours each in the following subjects: Anatomy, physiology, biochemistry, pathology, and pharmacology.

(b) The remainder of the minimum required hours may be taken in any of the subjects mentioned or in other basic sciences related to the specialty.

(ii) Active experience in diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above, as determined by this Board.

It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training.

This Board will recognize as proper institutions for securing this training those institutions which are approved for special training in Obstetrics and Gynecology and Obstetrical-Gynecological Surgery by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

This Board will also recognize as proper institutions for securing this training those institutions which are approved for special training in general or gynecological surgery by the approving agencies of the American Osteopathic Association, provided that the total 3-year training period includes the required training in Obstetrics and Gynecology and Obstetrical-Gynecological Surgery, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

g. He must practice as a specialist in his field for a period of at least 2 years subsequent to the minimum 3 years of special training as defined by this Board prior to being examined.

h. Thesis:

1. The applicant shall submit a thesis which shall be a report of an original investigation in the specialty field by the applicant or a review of the literature to which the applicant shall add personal experiences referable to the subject matter. This Board may accept a previously published article on a subject in the specialty fields covered by this Board. Grading of the article will be based on English composition and neatness as well as upon the subject matter.

2. Unacceptable Case Records and Thesis

This Board reserves the right to refuse for credit any case record or records or any thesis if, in its judgment, they do not conform to the standards previously mentioned.

i. Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the

current advances in the specialty, and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of his specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty.

j. Modification of requirements:

In the case of any applicant who was engaged in the practice of his specialty by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements stated in Article IV, Section 1, (a), (b), (c), (d), and (e) of the Bylaws of this Board, and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty field, the requirements of Article IV, Section 1, paragraphs (f) and (h) of the Bylaws of this Board may be waived and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

REQUIREMENTS FOR CERTIFICATION IN OBSTETRICS AND GYNECOLOGY

1. Percentage of practice in the field covered by this specialty shall be not less than 60 per cent. The applicant must supply a notarized affidavit of the foregoing.

2. The applicant shall furnish an affidavit of having been first assistant to a qualified specialist in the management of not less than 50 pathological pelvic deliveries as encountered during his assistantship, and 200 cases of a gynecological nature.

3. The applicant must show notarized documented evidence of handling, on his own responsibility, not less than 25 pathological pelvic deliveries and such other nonpathological deliveries as were encountered in the practice of the specialty.

4. The applicant must show notarized documented evidence of handling, as a responsible physician, 100 gynecological cases in which he shall have (a) made a complete examination, including laboratory studies; (b) determined a diagnosis; (c) recommended a gynecological or obstetrical-gynecological surgical treatment; (d) observed or participated in a surgical correction of a pathology found, or performed the gynecological or obstetrical-gynecological surgical treatment; and (e) followed the patient through her convalescence to recovery. A reasonable proportion of obstetrical-gynecological surgical and gynecological cases shall be included.

5. The applicant shall send to the Secretary-Treasurer of this Board authentic copies of 15 pathological obstetrical case records, and 10 complicated gynecological case records. The applicant must file an affidavit certifying that the records are exact copies of authentic records in his files, and that he personally cared for the cases presented. All records must be presented in printed form. The obstetrical case records must include a history, physical examination, routine and special laboratory examinations, antepartum, labor, delivery, and postpartum progress records of sufficient quality to clearly reflect the detailed management of the case to the time of dismissal. The gynecological case records shall include history, physical examination, routine and special laboratory examinations, diagnosis, detailed treatment notes, progress notes, and case summary.

REQUIREMENTS FOR CERTIFICATION IN OBSTETRICAL-GYNECOLOGICAL SURGERY

1. Percentage of practice by the applicant in the Obstetrical-Gynecological Surgical phases shall not be less than 75 per cent. The applicant must supply a notarized affidavit of the foregoing.

2. The applicant shall furnish an affidavit of having been first assistant to a qualified specialist in the management of not less than 50 pathological pelvic deliveries and such other nonpathological deliveries as were encountered during his assistantship.

3. The applicant must show notarized documented evidence of handling on his own responsibility not less than 25 pathological pelvic deliveries and such other nonpathological deliveries as were encountered in the practice of the specialty.

4. He shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major obstetrical-gynecological nature. Not more than 25 per cent of any one surgical procedure shall be permitted for accreditation towards the required number of operative assistantships.

5. He shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major obstetrical-gynecological nature. Not more than 25 per cent of any one surgical procedure shall be permitted for accreditation towards the required number of operative procedures performed on his own responsibility.

6. The applicant shall send to the Secretary-Treasurer of this Board authentic copies of 25 case records of major obstetrical-gynecological surgical procedures. The applicant must file an affidavit certifying that the records are exact copies of authentic records in his files and that he personally cared for the cases presented. All records must be presented in printed form. The case records must include a history, physical examination, all preoperative diagnostic procedures, operating technique, surgical findings, progress notes, pathological reports, and case summary up to the date of discharge from his care.

7. These records become the property of this Board and shall be placed on file with the Secretary-Treasurer of this Board for a minimum of 3 years.

8. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

AMERICAN OSTEOPATHIC BOARD OF OPHTHALMOLOGY AND OTORHINOLARYNGOLOGY

Preston J. Stack, Chairman, Los Angeles, California
J. Ernest Leuzinger, Vice Chairman, Philadelphia, Pennsylvania
C. L. Attebery, Kirksville, Missouri
C. M. Mayberry, East Liverpool, Ohio
Richard J. Murphy, Detroit, Michigan
Ralph S. Licklider, Secretary-Treasurer, Columbus, Ohio
Clifford C. Foster, Executive Secretary, Lakewood, Ohio

DEFINITION OF SPECIALTY PRACTICE

Sec. 1. For the purpose of the operation of this Board, the following divisions of practice are defined:

(a) The practice of ophthalmology shall consist of the diagnosis and treatment of the disorders and diseases of the eye and its adnexa, including refraction.

(b) The practice of otorhinolaryngology shall include the diagnosis and treatment of disorders and diseases of the ear, nose, and throat. It may include such other specialties as have a definite relationship to otorhinolaryngology.

(c) The practice of orofacial plastic surgery shall include the diagnosis, medical and surgical treatment and repair of developmental, congenital and acquired deformities of the mouth and face, to include the entire area of the head and neck.

REQUIREMENTS FOR CERTIFICATION

Sec. 1. To be eligible to receive a certificate of specialization from the American Osteopathic Board of Ophthalmology and Otorhinolaryngology the applicant must meet all of the following minimum requirements, excepting as provided in Section 3 and Section 4 of this Article:

(a) He must be a graduate of an approved osteopathic college.

(b) He must be licensed to practice in the state or territory where he conducts his specialty practice.

(c) He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination by this Board, and, if successful in passing his examination, he shall remain a mem-

ber in good standing in the American Osteopathic Association and in his state or divisional society.

(d) He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association, or satisfactory to the American Osteopathic Board of Ophthalmology and Otorhinolaryngology. If the applicant was graduated in 1942, or prior thereto, he must furnish evidence of training of equal value satisfactory to the American Osteopathic Board of Ophthalmology and Otorhinolaryngology.

(e) He shall be, and if certified continue to be, favorably known and recognized in his community and by his clientele as an osteopathic physician who is specializing in the practice of ophthalmology and/or otorhinolaryngology, in orofacial plastic surgery, or a specialty coming under the jurisdiction of this Board. He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

(f) He must provide notarized documentary evidence of a minimum of 3 years of special training in ophthalmology and/or otorhinolaryngology, or in orofacial plastic surgery, after the required 1 year of internship, or its equivalent, but not necessarily running 3 consecutive years. In the case of applicants who graduated prior to 1946, this Board may modify the requirement of 3 years of special training by allowing a credit of 1 year of special training for each 5 years of specialty practice, for a total of not to exceed 2 years of the requirement, but in no case may such applicant be accepted for examination without at least 1 year of special training. This training shall include:

(i) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

(ii) Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above, as determined by this Board.

(a) The training may consist of a 5-year assistantship to a certified specialist approved by this Board and by the approving agencies of the American Osteopathic Association, during which time he shall have assisted in at least 300 major surgical operations and shall have devoted at least 50 per cent of his time to the training program, followed by at least 2 years of successful specialty practice.

(b) The training may consist of 3 years of full-time assistantship to a certified specialist approved by this Board, and by the approving agencies of the American Osteopathic Association, in both hospital and office practice, followed by at least 2 years of successful specialty practice.

(c) The training may consist of an approved hospital residency in the specialty of not less than 2 years' time, followed by 2 years' assistantship to a certified specialist approved by this Board and 2 years of successful specialty practice.

It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

(g) He shall provide notarized documentary evidence that he has performed 100 major surgical operations in which he was the responsible surgeon.

(h) He shall present detailed case records acceptable to the American Osteopathic Board of Ophthalmology and Otorhinolaryngology of twenty-five major procedures in which he was the responsible surgeon, and handled within the past 5 years. These records shall include history, physical examination, routine laboratory work, special laboratory work, preoperative diagnosis, detailed findings, detailed operative procedure, postoperative diagnosis, the progress notes, gross and histological description and diagnosis of excised tissue, and a case summary.

(i) An applicant for certification by this Board who graduated prior to 1936, and who was engaged in the practice of his specialty by 1939 or prior thereto, and who meets the general requirements stated in Section 1, (a), (b), (c), and (d), and who has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty, the requirements of this article Section 1, paragraphs (f) and (h) may be waived, and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

(j) As a primary prerequisite for certification in a specialty under the jurisdiction of this Board, the applicant must show evidence of a well-developed understanding of the osteopathic principles and a demonstrated ability to apply these principles.

AMERICAN OSTEOPATHIC BOARD OF PATHOLOGY

Robert P. Morhardt, Chairman, South Pasadena, California
Dorsey A. Hoskins, Vice Chairman, Kansas City, Missouri
Otterbein Dressler, Detroit, Michigan
O. Edwin Owen, Philadelphia, Pennsylvania
Grover C. Stukey, Kirksville, Missouri
Norman W. Arends, Secretary-Treasurer, Huntington Woods, Michigan

DEFINITION OF SPECIALTY PRACTICE

Sec. 1. For the purpose of the operation of this Board the following divisions of practice are defined:

(a) The practice of clinical pathology shall consist of and include all phases of general clinical laboratory work, hematology, bacteriology, mycology, parasitology, serology, toxicology, and applied biochemistry.

(b) The practice of pathology shall consist of and include surgical pathology, autopsy surgery, histopathology and clinical pathology.

REQUIREMENTS FOR CERTIFICATION

Each applicant for examination for certification in clinical pathology or pathology, or any specialty coming under the jurisdiction of the American Osteopathic Board of Pathology, must present evidence that he has met the following minimum requirements.

a. Educational qualifications

1) An applicant must be a graduate of an osteopathic college approved by the American Osteopathic Association.

2) Internship

a) One year of internship, preferably a rotating internship, in a hospital approved for intern training by the American Osteopathic Association, or under exceptional circumstances other equivalent institutional training for a period of 1 year satisfactory to this Board.

b) An internship of 9 months shall constitute a recognized full internship if served during World War II as prescribed by the Selective Service Board and when such internships were recognized by the American Osteopathic Association as full internships.

c) If graduated in 1942 or prior thereto, the applicant must have had experience and/or training equivalent to that of an acceptable internship, as determined by this Board.

3) Special training

a) Pathology

A period of not less than 3 years of special training is required, after the required 1 year of internship or its equivalent

as defined above (a, 2), but not necessarily immediately following the internship nor running 3 consecutive years.

b) Clinical pathology

A period of not less than 3 years of special training is required, after the required 1 year of internship or its equivalent as defined above (a, 2), but not necessarily immediately following the internship nor running 3 consecutive years.

c) Institutions approved for special training

(1) This Board shall accept special training in pathology or clinical pathology in institutions which meet the Board's requirements and are approved for the specific special training by the approving agencies of the American Osteopathic Association.

(2) This Board requires that the laboratory be under the personal direction of a specialist in pathology (or for clinical pathology, a specialist in clinical pathology) recognized by this Board as capable of proper and thorough teaching of the trainee. He need not be certified but certification in the specialty is preferable.

(3) The laboratory, to be satisfactory, must have an annual minimal volume as follows:

2,000 determinations in hematology;
1,000 determinations in blood chemistry;
1,500 determinations in bacteriology, mycology, parasitology, and serology;
2,000 determinations in urinalyses, basal metabolism tests, electrocardiographs, gastric analyses, etc., and general miscellaneous laboratory work.

In addition, for pathology, the following minimal volume is required:

1,000 surgical-case tissues;
Postmortem examination of 35 per cent of the deaths in the hospital. A postmortem examination constitutes at least a thorough examination of the trunk in selected cases, additional explorations of the head, extremities, spinal cord, etc.

(4) The laboratory must have an adequate library in the specialty and in related sciences and fields of practice available to the trainee.

(5) The approval of the laboratory is on an annual basis.

(6) If a laboratory loses its status of approval, a trainee in that laboratory shall be given credit for the time spent in special training only during its period of approval.

d) Programs of special training

(1) The special training program must meet the minimum requirements established by the American Osteopathic Board of Pathology.

(2) The special training program must be approved by the Bureau of Hospitals if the trainee is classified as serving a residency.

(3) The special training program must be approved by the Committee on Accreditation of Postgraduate Training of the Bureau of Professional Education and Colleges if it is other than a residency. This program may be:

i) Fellowships: a graduate training program of a recognized college of osteopathy,

ii) Preceptorships: training programs of a qualified individual,

iii) Miscellaneous: other recognized postgraduate courses given by clinics, colleges, etc.

(4) Residency training, fellowship training, etc., may not be carried out simultaneously in the same laboratory.

(5) The program must meet the requirements to thoroughly train the individual in clinical pathology and/or pathology in all of the branches as defined in 1, a), b), above.

(6) This Board requires the following minimum requirements for approval of a program:

(a) Pathology

This special training shall include:

1. One year's clinical pathology training subdivided as follows:
   i) 3 months' hematology service;
   ii) 3 months' blood chemistry service;
   iii) 3 months' bacteriology, mycology, parasitology, and serology service;
   iv) 3 months' urinalyses and miscellaneous tests and general laboratory work service.
2. Two years' tissue pathology and autopsy surgery

(b) Clinical pathology

This special training shall include:

1. One year's service embracing the four divisions as stated above in (6), (a), 1;
2. Two years in the laboratory.

(c) A year is defined as 50 weeks of a minimum of 40 hours per week.

(d) Attendance at periodic clinicopathologic seminars and/or submission of original theses, the number and character to be determined by the trainer.

e) Status of the trainee

(1) A resident training program comes under the jurisdiction of the Bureau of Hospitals of the American Osteopathic Association. It is defined as a full-time training period appropriate to the specialty and of not less than 1 year's duration spent in an approved osteopathic hospital.

(2) Fellowship training programs come under the jurisdiction of the Committee on Accreditation of Postgraduate Training of the Bureau of Professional Education and Colleges.

(3) An individual may train as a resident or as a Fellow as long as the requirements of the special training program are fulfilled in an institution approved for the special training. Furthermore, a combination of both types may be served if desired or necessary to secure adequate training and may be served in more than one approved laboratory and under more than one qualified specialist.

(4) The trainee must register with this Board within 30 days from the time he begins the special training in his specialty. Forms for registration are available from the Secretary-Treasurer of this Board.

f) Modifications of requirements

The requirements of Article IV, Section 1, f) and h) of the Bylaws may be waived and the applicant recommended for certification after passing an appropriate oral and/or clinical examination, if the applicant was engaged in the practice of his specialty by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements as follows:

(1) He must be a graduate of an approved osteopathic college.

(2) He must be licensed to practice in the state or territory where he conducts his specialty practice.

(3) He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination.

(4) He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.

(5) He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

(6) He must have maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature or otherwise have indicated his consistent interest and competence in his specialty.

The final date for accepting applications under this classification shall be May 1, 1961.

g) Modification of requirements by previous commitments by this Board.

In the case of applicants to whom this Board has made definite commitments that a particular program which commenced prior to December 15, 1946, would meet the requirements for admission to examination for certification, the Board may waive such requirements of Article IV, Section 1, paragraphs d), f), and g) of the Bylaws as would prevent the admission of such applicants to examination. The requirements of the Bylaws in force at the time the commitments were made shall apply.

h) Modification of requirements for those who have engaged in specialty practice of pathology or clinical pathology.

If the applicant graduated prior to 1946, this Board may modify the specific requirement of special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for total credit of not to exceed 2 years of the requirement. In no case may such applicant be accepted for examination without at least 1 year of special training as defined.

b. Years of specialty practice

In addition to completing the required special training, the applicant shall have engaged in specialty practice in his field for not less than 2 years before admission to the examination. Specialty practice is defined as a mimimum of 90 per cent of the time occupied in professional practice in the specialty, which may include active specialty practice, teaching of pathology, or administration of a department of pathology or research. An affidavit in regard to the above may be required by the Credentials Committee of this Board in evaluating the applicant's application.

c. Membership requirements

The applicant must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination by this Board.

d. Licensure requirement

He must be licensed to practice in the state or territory where he conducts his specialty practice.

e. Code of Ethics requirement

He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

f. Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, and his familiarity with the current advances in the specialty, and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board may conduct the oral and written examinations at the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty. A full description of the method of conducting the examinations shall be formulated in this Board's Regulations and Requirements, and provision for re-examination shall be made.

AMERICAN OSTEOPATHIC BOARD OF PEDIATRICS

William S. Spaeth, Chairman, Drexel Hill, Pennsylvania
Mary E. Golden, Vice Chairman, Des Moines, Iowa
Patrick D. Philben, Dallas, Texas
H. Mayer Dubin, Rivera, California
Evangeline N. Percival, Secretary-Treasurer, Los Angeles

DEFINITION OF SPECIALTY PRACTICE

The practice of pediatrics shall consist of and include the utilization of all of those procedures necessary to the study and the management of the care of infants and children, as well as the prevention, diagnosis, and treatment of the diseases of infants and children from birth up to the average age of sexual maturity.

REQUIREMENTS FOR CERTIFICATION

Each applicant for certification under the jurisdiction of this Board must present evidence that he has met the following minimum requirements:

1. He shall have been graduated from an approved osteopathic college at least 6 years prior to consideration of his application by the American Osteopathic Board of Pediatrics.

2. He must be licensed to practice in the state or territory where he conducts his specialty practice.

3. He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to making application for examination by this Board.

4. He shall be, and if certified continue to be, favorably known and recognized in his community and by his clientele as an osteopathic physician who is specializing in the practice of pediatrics and shall publicize his osteopathic affiliation in an ethical manner.

5. He must be able to show evidence of conformance to the standards set in the Code of Ethics of the American Osteopathic Association.

6. He shall have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or other equivalent institutional training satisfactory to this Board. If the applicant was graduated in 1942 or prior thereto, he must have had training of value equivalent to that of an acceptable internship as determined by this Board.

7. He shall provide notarized documentary evidence of at least 3 years of special training related to the specialty after the required 1 year of internship or its equivalent, but not necessarily immediately following the internship nor running 3 consecutive years. In the case of applicants graduated prior to 1946, the Board may modify the requirements of 3 years of special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit not to exceed 2 years of the requirement. In no case may such applicant graduated prior to 1946 be accepted for examination without at least 1 year of special training as defined. This training shall include:

(a) Advanced studies in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, bacteriology, immunology, parasitology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

(b) Active experience in such amount and diversity in the practice of this specialty that it will assure adequate training in the specialty. The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board. The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above as determined by this Board. It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing the special training those institutions which are approved by the approving agencies of the American Osteopathic Association together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

8. Subsequent to completing the required special training, the applicant shall have engaged in specialty practice for not less than 2 years before admission to examination. To be considered as engaging in a specialty practice, the applicant shall devote 60 per cent or more of his time to the practice of pediatrics.

9. Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in this specialty, his familiarity with the current advances in the specialty field, and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant.

10. In the case of any applicant who was engaged in the practice of his specialty by 1939 or prior thereto and who

graduated prior to 1936, and who meets the general requirements as stated in Article IV, Section 1, (a), (b), (c), (d), and (e) of the Bylaws, and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty, the requirements of Article IV, Section 1, (f) and (h) of the Bylaws may be waived, and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

11. Each applicant for certification coming within the jurisdiction of this Board shall prepare and submit for publication at least three articles on pediatrics during the 3 years of special training and one article in each of the 2 years of specialty practice and shall forward copies of these articles to the Secretary-Treasurer of the American Osteopathic Board of Pediatrics.

AMERICAN OSTEOPATHIC BOARD OF PHYSICAL MEDICINE AND REHABILITATION

William W. W. Prichard, Chairman, Pasadena, California
Wallace M. Pearson, Vice Chairman, Kirksville, Missouri
Robert C. Ruenitz, Secretary-Treasurer, Los Angeles, California

DEFINITION OF SPECIALTY PRACTICE

The practice of physical medicine and rehabilitation shall consist of and include the use of all medical measures, especially those in the physical field, which will hasten the recovery and restoration of the ill or handicapped to the fullest physical, mental, social, vocational, and economic usefulness of which he or she is capable.

REQUIREMENTS FOR CERTIFICATION

To be eligible to receive a certificate of specialization from this Board, the applicant must meet all of the following minimum requirements, excepting as provided in Article IV, Section 2 of the Bylaws of this Board:

a. He must be a graduate of an approved osteopathic college.

b. He must be licensed to practice in the state or territory where he conducts his specialty practice.

c. He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years prior to application for examination by this Board.

d. He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.

e. He must practice as a specialist in his field for a period of at least 2 years subsequent to the minimum 3 years of special training.

f. Percentage of practice in the field covered by this specialty shall not be less than 60 per cent. An affidavit of proof of practice may be required by this Board from the applicant.

g. Number of case records

1. The applicant must present evidence of handling on his own responsibility not less than 200 cases applicable to this specialty. This evidence must include: history, structural examinations, general physical examination, record of special muscle and nerve testings where applicable, treatment prescribed, and progress notes of the case, including termination of treatment or at the latest date patient was observed.

2. Documentary evidence of the above may be requested by this Board.

3. These records become the property of this Board and shall be placed on file with the Secretary-Treasurer for a minimum of 3 years.

h. Thesis

1. The applicant shall submit reprints or copies of representative articles which have been published or have been prepared for publication. The thesis, a monograph, shall be an original investigation in the specialty field as conducted by the applicant or a review of the literature to which the applicant shall add personal experiences referable to the subject matter.

2. This Board shall submit to the applicant three titles as suggestions for the monograph. If these are not acceptable to the applicant, the applicant may submit a title of his choice to the Board for approval.

3. The title of the thesis must be approved by this Board and the title shall be recorded in the office of the Secretary-Treasurer.

4. The form of the thesis shall follow a stylebook of the applicant's choosing. The author and title of the stylebook shall be included in the bibliography.

5. Sufficient copies shall be submitted to the Secretary-Treasurer of this Board to permit distribution of the thesis to the members of the Examination Committee.

i. Training

A period of not less than 3 years of special training related to the specialty shall be required, after the required 1 year of internship or its equivalent, but need not immediately follow the internship, nor run 3 years consecutively. In the case of applicants who graduated prior to 1946, this Board may modify the requirements of 3 years' special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement, but in no case may such an applicant graduated prior to 1946 be accepted for examination without at least 1 year of special training.

This training shall include:

1. Advanced study in the sciences: Anatomy, physics, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as may be required by this Board.

2. Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

3. The clinical aspects of physical medicine:

a. Thermotherapy

Clinical applications of heat and cold, both local and general.

b. Hydrotherapy

Methods of employing hydrotherapeutic devices and procedures.

c. Electrotherapy

Clinical, diagnostic, and therapeutic uses of the constant current, interrupted current, sinusoidal current, and high frequency current.

d. Radiation therapy

Diagnostic and therapeutic uses of ultra-violet and infra-red radiation. (Therapeutic applications of roentgen rays and atomic radiation are not included in the field of physical medicine and rehabilitation.)

e. Kinesitherapy

Clinical uses in diagnosis and treatment by exercise.

f. Occupational therapy

Indications for and clinical applications of the various types.

g. Rehabilitation

The diagnostic and therapeutic use of convalescent reconditioning and rehabilitation of the seriously disabled person.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of several types mentioned above, as determined by this Board.

It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training.

This Board will recognize as proper institutions for securing this training those institutions which are approved for spe-

cial training by the approving agencies of the American Osteopathic Association, and such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

j. Modification of Requirements

In the case of any applicant who was engaged in the practice of his specialty by 1939 or prior thereto, and who graduated prior to 1936, and who meets the general requirements stated in Article IV, Section 1, (a), (b), (c), (d), and (e) of the Bylaws of this Board, and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature or otherwise has indicated his consistent interest and competence in his specialty field, the requirements of Article IV, Section 1, paragraphs (f) and (h) of the Bylaws of this Board may be waived and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

k. Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the current advances in the specialty, and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board may conduct the oral and written examinations at the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty. A full description of the method of conducting the examination shall be formulated in this Board's Regulations and Requirements, and provision for re-examination shall be made.

AMERICAN OSTEOPATHIC BOARD OF PROCTOLOGY

Carl S. Stillman, Jr., Chairman, San Diego, California
John W. Orman, Vice Chairman, Tulsa, Oklahoma
George R. Norton, Fort Lauderdale, Florida
Lester I. Tavel, Houston, Texas
Frank D. Stanton, Boston, Massachusetts
Carlton M. Noll, Secretary-Treasurer, Evergreen, Colorado

DEFINITION OF SPECIALTY PRACTICE

For the purpose of clarification the following division of specialty practice is defined:

a. The practice of proctology shall consist of and include the treatment of diseases and conditions originating within or affecting the anus, rectum, perianal and perirectal areas, and related or complicating conditions not including the use of major surgery.

REQUIREMENTS FOR CERTIFICATION

To be eligible to receive a certificate of specialization from the American Osteopathic Board of Proctology, the applicant must meet all of the following minimum requirements except as provided in Article IV, Section 2, of the Bylaws of the American Osteopathic Board of Proctology.

a. He must have been graduated from an approved osteopathic college at least 5 years prior to application.

b. He must be licensed to practice in the state or territory where he conducts his specialty practice.

c. He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to application for examination by this Board.

d. He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or other equivalent institutional training satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board.

e. He shall be, and if certified continue to be, favorably known and recognized in his community and by his clientele as an osteopathic physician who is specializing in the practice of proctology and shall publicize his osteopathic affiliation in an ethical manner.

f. He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

g. A period of not less than 3 years of special training related to the specialty shall be required, after the required 1 year of internship, or its equivalent, but not necessarily immediately following the internship nor running 3 consecutive years, except that in the case of applicants who graduated prior to 1946, the Board may allow the requirement of 3 years of special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit of not to exceed 2 years of the requirement, but in no case may an applicant graduated prior to 1946 be accepted for examination without at least 1 year of special training as defined. This training shall include:

(i) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

The minimum requirement in the basic sciences shall be 100 clock hours subdivided as follows:

Anatomy 10 hours; physiology 10 hours; biochemistry 10 hours; pathology 10 hours; pharmacology 10 hours; bacteriology and parasitology 10 hours.

The balance of 40 hours shall include such other basic sciences as this Board may require from time to time.

(ii) Active experience in diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty.

h. He must practice as a specialist in his field for a period of at least 2 years subsequent to the minimum 3 years of special training.

i. Training Requirements:

(1) Active experience in the diagnosis and treatment in such amount and diversity that it will assure adequate training in the specialty. The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of several types mentioned above, as determined by this Board. It shall be this Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

j. Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the current advances in the specialty, and the possession of sound judgment and a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board of specialty certification may conduct its oral and written examinations at

the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty.

k. In the case of any applicant who has engaged in the practice of his specialty by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements stated in Section 1, (a), (b), (c), (d), and (e) of the Bylaws of this Board, and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty, the requirements of Article IV, paragraphs (f) and (h) of the Bylaws of this Board may be waived and he may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

l. Affidavit:

The applicant shall file with the Secretary-Treasurer of this Board an affidavit in duplicate stating the percentage of his practice that was proctologic in character during the preceding 12-month period, based on the number of patients seen. An applicant must have a minimum of 75 per cent proctologic specialty practice to be eligible for examination.

m. Case Records:

The applicant must file with the Secretary-Treasurer of this Board true and authentic copies of 200 case records of proctologic cases he has cared for within the 4-year interval preceding the filing of his application. The applicant must file an affidavit in duplicate certifying that the records are exact copies of true and authentic records in his files and that he personally cared for the cases represented. The case records and affidavit must reach the Secretary-Treasurer of this Board not later than April 15th for the applicant to be eligible for examination at the following annual meeting of this Board. All records become the property of this Board and are not returnable to the applicant.

n. Scientific Article:

The applicant must file with the Secretary-Treasurer of this Board by April 15th of the year he desires examination, a 1,000-word article on a proctologic subject of his choosing or at the dictates of this Board. This Board may accept a previously published article on a proctologic subject. Grading of this scientific article will be based on English composition and neatness as well as upon the subject matter. Scientific articles must follow the standard in common use for composition in such articles.

AMERICAN OSTEOPATHIC BOARD OF RADIOLOGY

William L. Tanenbaum, Chairman, Detroit, Michigan
Burwell S. Keyes, Vice Chairman, Los Angeles, California
Theodore C. Hobbs, Columbus, Ohio
Paul T. Lloyd, Philadelphia, Pennsylvania
George W. Rea, Kirksville, Missouri
D. W. Hendrickson, Secretary-Treasurer, Wichita, Kansas

DEFINITION OF SPECIALTY PRACTICE

For the purposes of clarification the following definitions of the divisions of the special fields in radiology are given:

a. The practice of diagnostic roentgenology shall consist of and be confined to the performance and interpretation of diagnostic roentgenological procedures.

b. The practice of roentgenology shall consist of and be limited to the performance and interpretation of diagnostic roentgenological procedures and the use of roentgen rays in therapy.

c. The practice of radiation therapy shall consist of treatment of human disease by the use of roentgen rays, radium, and artificial radioactive substances.

d. The practice of radiology shall consist of and include the performance and interpretation of diagnostic roentgenological procedures and the diagnosis and treatment of human disease by the use of roentgen rays, radium, and artificial radioactive substances.

REQUIREMENTS FOR CERTIFICATION

The American Osteopathic Board of Radiology will accept for certification only osteopathic physicians who are specializing in one of the divisions of radiology coming under the jurisdiction of this Board. The proportion of specialization in practice which is acceptable to the Board may vary according to the size of the community and the conditions under which the applicant practices. The applicant must be engaged in the practice of one of the divisions of radiology coming under the jurisdiction of this Board, i.e., diagnostic roentgenology, roentgenology, radiology, or radiation therapy, and he must present evidence satisfactory to the Board that he is so practicing.

Each applicant for certification under this Board must present evidence that he has met the following minimum requirements:

1. He shall have been graduated from an approved osteopathic college at least 5 years prior to consideration of his application by this Board.

2. He must have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to making application for examination by this Board.

3. He shall be, and if certified continue to be, favorably known and recognized in his community and by his clientele as an osteopathic physician who is specializing in the practice of one of the divisions of radiology coming under the jurisdiction of this Board and shall publicize his osteopathic affiliations in an ethical manner.

4. He must have satisfactorily completed an internship of at least 1 year in a hospital approved for intern training by the American Osteopathic Association or satisfactory to this Board. If graduated in 1942 or prior thereto, the applicant must have had training of value equivalent to that of an acceptable internship as determined by this Board. The intern year of 9 months as prescribed by the Selective Service Board during World War II shall be acceptable as fulfilling this requirement.

5. He must be licensed to practice in the state or territory where he conducts his specialty practice.

6. He must be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

7. He shall provide documentary evidence of at least 3 years of special training related to the specialty for which he is seeking certification, after the required 1 year of internship, or its equivalent, but not necessarily running 3 consecutive years. This Board may modify the requirement of 3 years' special training by allowing a credit of 1 year of special training for each 5 years of specialty practice for a total credit not to exceed 2 years of the requirement, for physicians who graduated prior to 1946, but in no case may such applicant be accepted for examination without at least 1 year of special training as defined. This training shall include:

(a) Advanced study in the sciences: Anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

(b) Active experience in such amount and diversity that it will assure adequate training in the specialty.

The special training may be provided in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board, or by serving an acceptable assistantship to or studying under the preceptorship of a qualified specialist in this field, supplemented by prescribed study conforming to a plan approved by this Board.

The minimum 3-year period of special training may be made up of varying combinations of the several types mentioned above, as determined by this Board. It shall be this

Board's duty to assist applicants in determining a suitable program of special training, but it is not this Board's function to supply the training. This Board will recognize as proper institutions for securing this training those institutions which are approved for special training by the approving agencies of the American Osteopathic Association, together with such others as this Board may determine to possess facilities and personnel adequate to provide proper training.

8. In addition to completing the required special training, the applicant shall have engaged in specialty practice in his field for not less than 2 years before admission to examination.

9. Following satisfactory compliance with the prescribed requirements as to special training and specialty practice, the applicant shall be required to pass appropriate examinations planned to evaluate his understanding of the scientific bases of the problems involved in the specialty, his familiarity with the current advances in the specialty, and the possession of sound judgment and of a high degree of skill in the diagnostic and therapeutic procedures involved in the practice of the specialty. Oral, written, and clinical examinations shall be conducted and required in the case of each applicant. This Board may conduct the oral and written examinations at the end of the required 3 years of special training, but shall not conduct the practical or clinical examination until the required 2 years of specialty practice have been completed. The members of this Board shall personally review, if not perform, the grading of each written examination. The conduct of the clinical examinations may be delegated to committees of not fewer than two individuals maturely qualified in the specialty. A full description of the method of conducting the examination shall be formulated in this Board's Regulations and Requirements, and provision for re-examination shall be made.

10. In the case of any applicant who was engaged in the practice of his specialty by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements as stated above, and has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty, the requirements of Article IV, Section 1, paragraphs (f) and (h) of the Bylaws may be waived and he may be recommended for certification after passing appropriate oral and/or written clinical examinations. The final date for accepting applications under this classification shall be May 1, 1961.

11. Applicants for certification in any of the divisions of radiology shall prepare a thesis upon some phase of radiology as a part of the written examination for certification.

AMERICAN OSTEOPATHIC BOARD OF SURGERY

James M. Eaton, Chairman, Philadelphia, Pennsylvania
Howard A. Graney, Vice Chairman, Des Moines, Iowa
Don E. Ranney, Grosse Pointe Woods, Michigan
Robert F. McBratney, Los Angeles, California
K. George Tomajan, Boston, Massachusetts
Paul R. Koogler, St. Petersburg, Florida
Ernest G. Bashor, Los Angeles, California
Arthur M. Flack, Jr., Philadelphia, Pennsylvania
Charles L. Ballinger, Secretary-Treasurer, Toledo, Ohio

DEFINITION OF SPECIALTY PRACTICE

For the purpose of clarification the following divisions of specialty practice coming under the jurisdiction of the American Osteopathic Board of Surgery are defined.

1. The practice of surgery shall consist of and include that branch of medical science, art, and practice which is concerned with the correction of deformities and defects, the repair of injuries, the diagnosis and care of disease, the relief of suffering, and the prolongation of life by manual and instrumental means.

2. The practice of gynecological surgery shall consist of and include that branch of medical science, art, and practice which is concerned with major operative procedures upon the female generative system or structures related thereto within the lower abdomen and pelvis, and major plastic procedures upon the vaginal tract by manual and instrumental means.

3. The practice of neurosurgery shall consist of and include that branch of medical science, art, and practice which is concerned with the correction of deformities and defects, the repair of injuries, and the diagnosis and care of diseases of the nervous system by manual and instrumental means.

4. The practice of orthopedic surgery shall consist of and include that branch of medical science, art, and practice which is concerned with the correction of deformities and defects of the bony skeleton and associated structures, the repair of injuries to the bones and joints, and the diagnosis and care of diseases of the bones and joints by manual and instrumental means.

5. The practice of peripheral vascular surgery shall consist of and include that branch of medical science, art, and practice which is concerned with the correction of deformities and defects of the peripheral vessels, the repair of injuries to the peripheral vessels, and the diagnosis and care of peripheral vascular diseases by manual and instrumental means.

6. The practice of plastic surgery shall consist of and include that branch of medical science, art, and practice which is concerned with the repair of injuries and the correction of defects and deformities to the integument, muscles, and the bony skeleton and associated structures of the body by manual and instrumental means.

7. The practice of urological surgery shall consist of and include that branch of medical science, art, and practice which is concerned with the correction of deformities and defects, the repair of injuries, and the diagnosis and care of diseases of the urogenital organs by manual and instrumental means.

BASIC REQUIREMENTS FOR CERTIFICATION

The American Osteopathic Board of Surgery shall accept for examination for certification only osteopathic physicians who are specializing in one of the specialty fields coming under the jurisdiction of this Board. The proportion of specialization in practice which is acceptable to this Board may vary according to the size of the community and the conditions under which the applicant practices.

The applicant must be engaged in the practice of surgery or one of the specialty fields coming under the jurisdiction of this Board, i.e., neurosurgery, gynecological surgery, orthopedic surgery, peripheral vascular surgery, plastic surgery, urological surgery, or anesthesiology and he must present evidence to this Board that he is so practicing.

It shall be the policy of the American Osteopathic Board of Surgery to require each applicant to submit a list of his surgical operative procedures (or anesthetic procedures) for the 12-month period immediately prior to making application, naming the type of operation, the hospital in which the operation was performed, the patient's initials, the hospital case number, the pathologist's report, and the case termination.

This list shall be certified by the administrator of the hospital in which the surgeries were performed and shall be accompanied by a supplementary list in which the operative procedures for the year are broken down into segregated totals indicating the number of each type of operative procedure performed by the applicant during the 12-month period. The totals of both lists must agree.

It shall be the policy of this Board to require the Credentials Committee to carefully scrutinize the scope of surgical or anesthetic practice represented in each applicant's report. Unless an applicant presents evidence that the scope of his specialty practice is sufficiently varied and of a major character (as shown by his hospital records) the Credentials Committee shall not recommend him for examination without an examination by one or more certified specialists not located in the applicant's immediate vicinity who have been appointed by this Board for the purpose of determining the applicant's qualifications.

It shall be the policy of this Board to admit to examination only those surgeons or anesthetists who qualify as recognized specialists in their respective fields in the community in which they conduct their specialty practice.

Each applicant for examination for certification in surgery or one of the surgical specialty fields coming under the jurisdiction of the American Osteopathic Board of Surgery must present evidence that he has met the following minimum requirements:

1. He shall have graduated from an approved osteopathic college at least 7 years prior to consideration of his application by this Board.

2. He shall be licensed to practice in the state or territory where he conducts his specialty practice.

3. He shall have been a member in good standing of the American Osteopathic Association and of his state or divisional society for a continuous period of at least 3 years immediately prior to making application for examination by this Board.

4. He shall be, and if certified continue to be, favorably known and recognized by his clientele as an osteopathic physician who is specializing in the practice of surgery or a surgical specialty coming under the jurisdiction of this Board and shall publicize his osteopathic affiliations in an ethical manner.

5. He shall be able to show evidence of conformity to the standards set in the Code of Ethics of the American Osteopathic Association.

6. He shall have had an internship of at least 1 year in a hospital acceptable to this Board. The intern year of 9 months as prescribed by the Selective Service Board during World War II shall be acceptable. For physicians who graduated in 1942 or prior thereto this Board may accept other qualifications in lieu of internship where the applicant's surgical experience and ability are beyond question.

7. He shall provide notarized documentary evidence of a minimum of 3 years of formal training subsequent to his internship. This formal training program must be acceptable to this Board and made up, either in whole or in part, of (a) an approved surgical residency; (b) approved preceptorship training programs which commenced after January 1, 1951, shall consist of 3 years for full-time training programs or 5 years for part-time training programs; (c) approved postgraduate work in surgery or the surgical sciences in a program acceptable to this Board. Not more than 1 year's credit shall be given for postgraduate work in approved graduate school programs.

During the period of his formal training, he shall have assisted in the performance of not less than 400 major surgical operations. By "first assistant" is meant one who, in addition to acting as first assistant at the operating table, has participated actively in the preoperative diagnostic procedures and postoperative care.

In qualifying for examination for certification only one credit for first assistantship is allowable for each case done by the surgeon regardless of the number of assistants working at the table.

8. He shall provide evidence to this Board that he has received satisfactory postgraduate training in the surgical sciences, including anatomy, physiolgoy, biochemistry, pathology, and pharmacology.

The applicant who began a specialty training program after January 1, 1951, and who has pursued a training program other than a residency approved by the Board of Trustees of the American Osteopathic Association, shall provide evidence to this Board that he has received satisfactory postgraduate training in the surgical sciences, including anatomy, physiology, biochemistry, pathology, pharmacology, and such other basic sciences as are necessary to a mature and comprehensive understanding of the prevention, diagnosis, therapy, and management of the disorders involved in the specialty.

A minimum of 100 clock hours shall be required in the basic science training programs, subdivided as follows:

a. A minimum of 10 clock hours each in the following subjects: anatomy, physiology, biochemistry, pathology, and pharmacology.

b. The remainder of the minimum required hours may be taken in any of the subjects mentioned or in other basic sciences related to the specialty.

Those applicants who qualify must submit acceptable documentary evidence, which may be further investigated at the discretion of this Board, of having pursued this advanced training in colleges, laboratories, clinics, hospitals, or other facilities satisfactory to this Board.

9. He must practice as a specialist in his field for a period of at least 2 years subsequent to the completion of the required minimum of 3 years of special training prior to being examined. He shall provide notarized documentary evidence that he has performed a minimum of 200 major surgical operations upon his own responsibility subsequent to the completion of the minimum required period of formal training.

An applicant's scope of surgical practice must be such that his records will show that he has handled and is capable of handling (as shown by his morbidity, mortality, and end results) major surgical procedures in his respective specialty field. In surgery this would include such procedures as thyroidectomies, gastrectomies, excision of the colon, etc. An applicant whose hospital records show that he has never performed what are commonly referred to as heavy surgical procedures on his own responsibility would not be eligible for admission to examination.

10. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

11. He shall present detailed case records, acceptable to this Board, of 25 major surgical procedures in which he was the responsible surgeon and handled by him as a surgical problem within the past 3 years. These records shall include history, physical examination, routine and special laboratory examinations, preoperative diagnosis, detailed findings, detailed operative procedure, postoperative diagnosis, progress notes, gross and histological description and diagnosis of the excised tissue, and case summary.

12. In the case of any applicant who was engaged in the practice of surgery (or one of the specialty fields of surgery coming under the jurisdiction of this Board) by 1939, or prior thereto, and who graduated prior to 1936, and who meets the general requirements stated in Article IV, Section 1, (a), (b), (c), (d), and (e) of the Bylaws, and who has maintained appropriate activity in American Osteopathic Association organizational work, specialty societies, hospital staff work, the pursuit of periodic postgraduate work, contributions to professional literature, or otherwise has indicated his consistent interest and competence in his specialty field, the requirements of Article IV, Section 1, (f) and (h) of the Bylaws may be waived and the applicant may be recommended for certification after passing an appropriate oral and/or clinical examination. The final date for accepting applications under this classification shall be May 1, 1961.

NEUROSURGERY

Each applicant for examination for certification in neurosurgery must present evidence that he has met the minimum basic requirements.

1. Under requirement No. 7 he shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major neurosurgical nature.

2. Under requirement No. 9, he shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major neurosurgical nature.

3. Under requirement No. 11, the case records presented shall consist of 25 major neurosurgical procedures.

4. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

5. If this Board approves his application as to qualifications for examination in neurosurgery, the Secretary-Treasurer shall request the American Osteopathic Board of Neurology and Psychiatry to consider the application and, if acceptable, to examine the applicant in neurology.

6. If the applicant is successful before the American Osteopathic Board of Neurology and Psychiatry, the American Osteopathic Board of Surgery shall be so informed and shall, in turn, examine the applicant in neurosurgery.

7. If the applicant is successful in the examination before the American Osteopathic Board of Surgery, this Board shall make recommendation for certification to the Advisory Board for Osteopathic Specialists according to the regular procedure.

8. Upon final approval by the Board of Trustees of the American Osteopathic Association, a special certificate shall be issued in neurosurgery by this Board, signed by the Chairman and Secretary-Treasurer of the American Osteopathic Board of Neurology and Psychiatry, in addition to the officers of the

American Osteopathic Board of Surgery and the Executive Secretary of the American Osteopathic Association.

GYNECOLOGICAL SURGERY

Each applicant for examination for certification in gynecological surgery must present evidence that he has met the minimum basic requirements.

a) Under requirement No. 7, he shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major gynecological nature. Not more than 25 per cent of any one surgical procedure shall be permitted for accreditation towards the required number of operative assistantships.

b) Under requirement No. 9, he shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major gynecological nature. Not more than 25 per cent of any one surgical procedure shall be permitted for accreditation towards the required number of operative procedures performed on his own responsibility.

c) Under requirement No. 11, the case records presented shall consist of 25 major gynecological procedures.

d) He shall demonstrate his fitness to take the examination in any other manner required by this Board.

ORTHOPEDIC SURGERY

Each applicant for examination for certification in orthopedic surgery must present evidence that he has met the minimum basic requirements.

1. Under requirement No. 7, he shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major orthopedic nature.

2. Under requirement No. 9, he shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major orthopedic nature.

3. Under requirement No. 11, the case records presented shall consist of 25 major orthopedic procedures.

4. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

PERIPHERAL VASCULAR SURGERY

Each applicant for examination for certification in peripheral vascular surgery must present evidence that he has met the minimum basic requirements.

1. Under requirement No. 7, he shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major peripheral vascular nature.

2. Under requirement No. 9, he shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major peripheral vascular nature.

3. Under requirement No. 11, the case records presented shall consist of 25 major peripheral vascular surgical procedures.

4. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

PLASTIC SURGERY

Each applicant for examination for certification in plastic surgery must present evidence that he has met the minimum basic requirements.

1. Under requirement No. 7, he shall have completed a minimum of 2 years of approved formal surgical training either in an approved residency or an approved full-time preceptorship training program followed by 1 or more years of acceptable training in the specialty field of plastic surgery. He shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major plastic surgical nature.

2. Under requirement No. 9, he shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major plastic surgical nature.

3. Under requirement No. 11, the case records presented shall consist of 25 major plastic surgical procedures.

4. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

5. A physician certified in surgery who desires to have his certification changed from surgery to plastic surgery shall be required to follow the prescribed procedure.

UROLOGICAL SURGERY

Each applicant for examination for certification in urological surgery must present evidence that he has met the minimum basic requirements.

1. Under requirement No. 7, he shall have assisted in the performance of not less than 400 major surgical operations, 200 of which must be of a major urological nature.

2. Under requirement No. 9, he shall have performed a minimum of 200 major surgical operations in which he was the responsible surgeon, 100 of which must be of a major urological nature.

3. Under requirement No. 11, the case records shall consist of 25 major urological procedures.

4. He shall demonstrate his fitness to take the examination in any other manner required by this Board.

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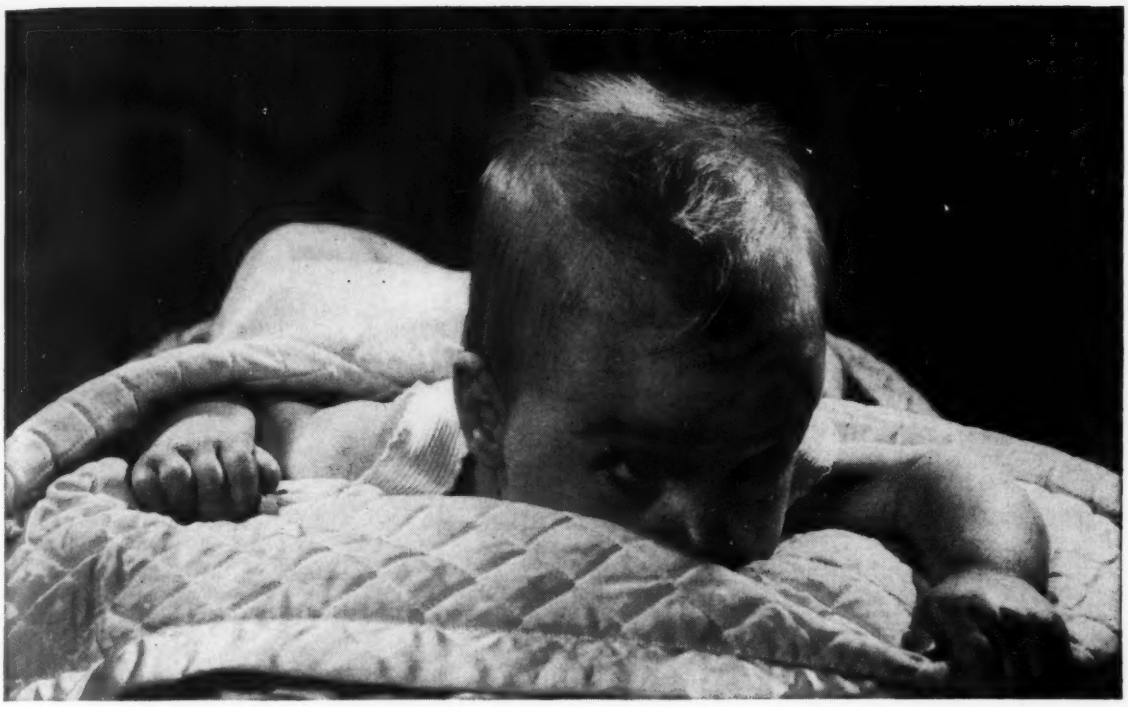

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1. *Tittle, C.R.: The Effects of 3,5,3' L-triiodothyronine in Patients with Metabolic Insufficiency, J.A.M.A. 162:271 (Sept. 22) 1956.*

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1. Smith, N. J., and Rosello, S.: J. Clin. Nutr. 1:275 (May-June) 1953.
2. Sturgeon, P.: Pediatrics 13:107 (Feb.) 1954.
3. McLean, E. B.: Pediatrics 7:136 (Jan.) 1951.
4. Jackson, R. L.: J.A.M.A. 160:976 (Mar. 17) 1956.
5. Tuttle, A. H., and Etteldorf, J. N.: J. Pediat. 41:170 (Aug.) 1952.
6. Dieckmann, W. J., and Priddle, H. D.: Am. J. Obstet. & Gynec. 57:541 (Mar.) 1949.

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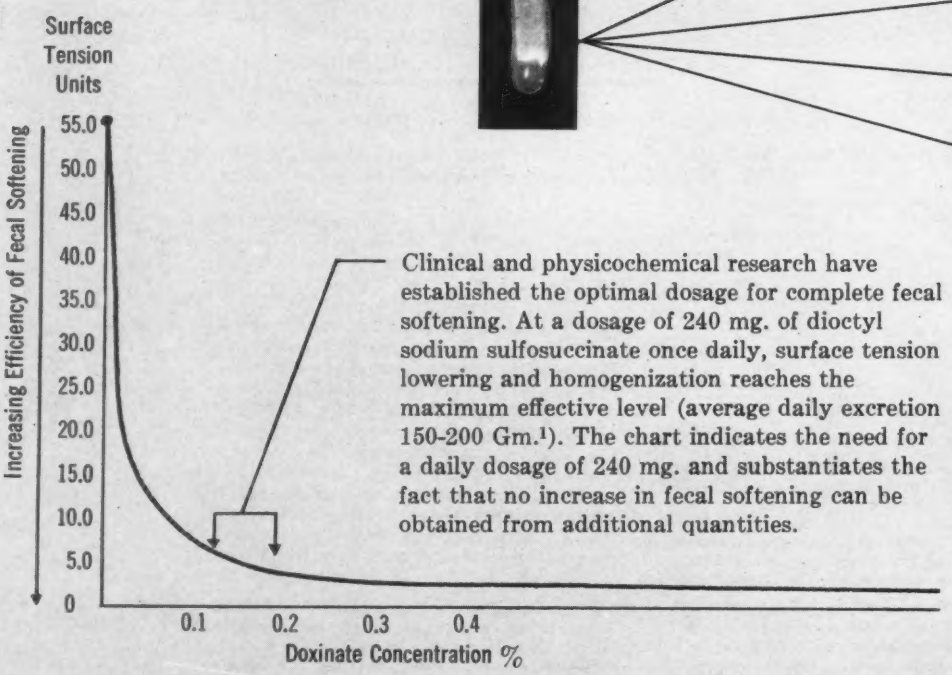

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1. Best & Taylor, The Physiological Basis of Medical Practice, 6th Ed.

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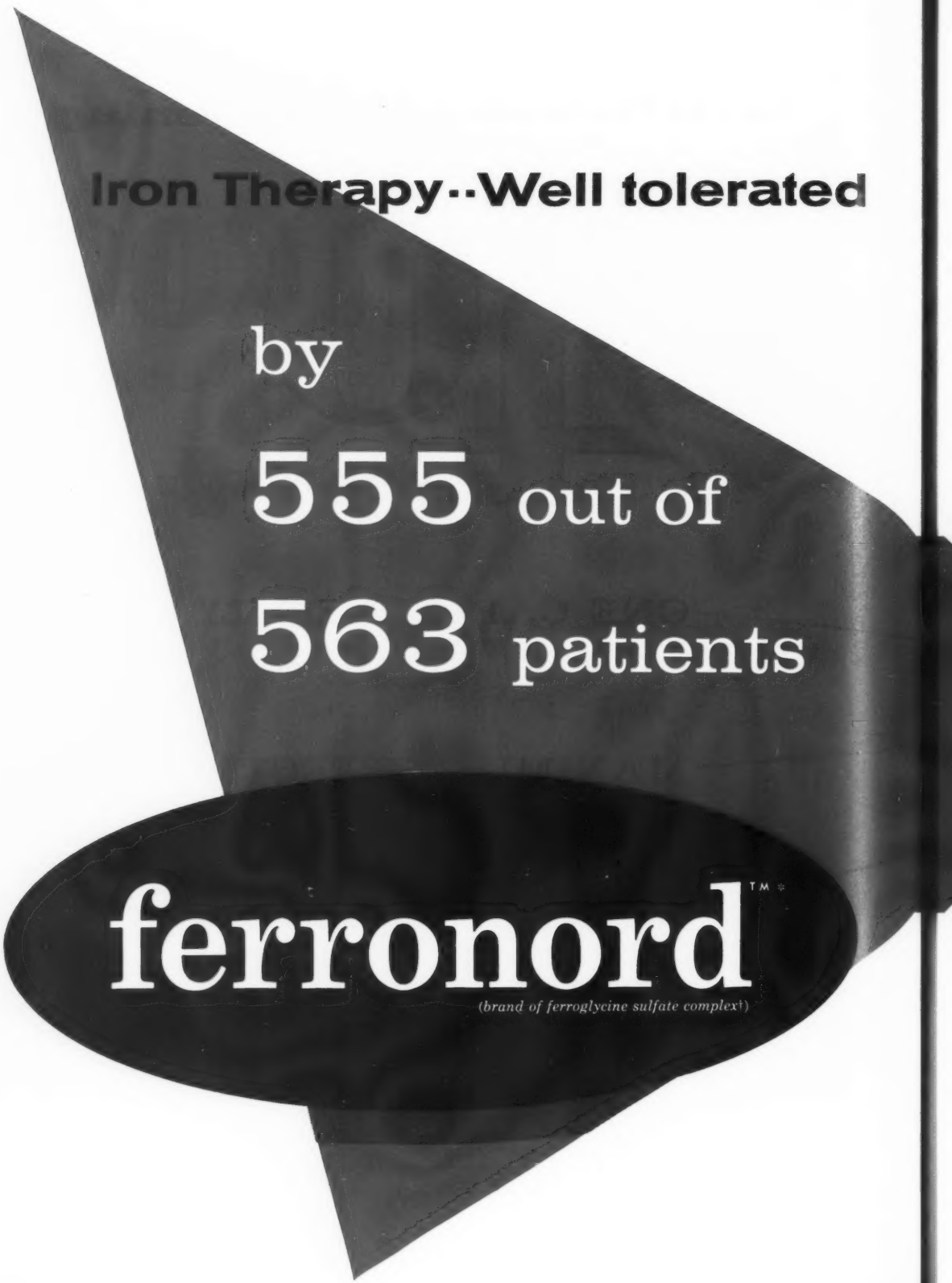
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1. Frohman, I. P.; Pomeranze, J.; Rummel, W.; Kircher, R. F.; Clancy, J. B.; Dwyer, T. A.; Wagner, H.; O'Brien, T. E.; Curley, R. T.; Jörgensen, G.; Onorato, R. R.; Ira, F.; Lee, Jr., J. G.; Gorla, W. O.; White, R. N.; Gadek, R. J.; Remy, D.: Scientific Exhibit, 6th International Congress of Hematology, Boston, Mass., August, 1956.
2. Wagner. H.: Landarzt *31*:496, 1955.
3. Jörgensen, G.: Arztl. Wchnschr. *10*:82, 1955.

*Pat. Pending. †α-aminoacetic-ferrous sulfate complex, exsiccated

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1. Weiss, E., and English, O.S.: Psychosomatic Medicine. W. B. Saunders Co., Philadelphia, 1949, pp. 358-359.
2. Lemere, F.: Northwest Med. *54*:1098 (Oct.) 1955.

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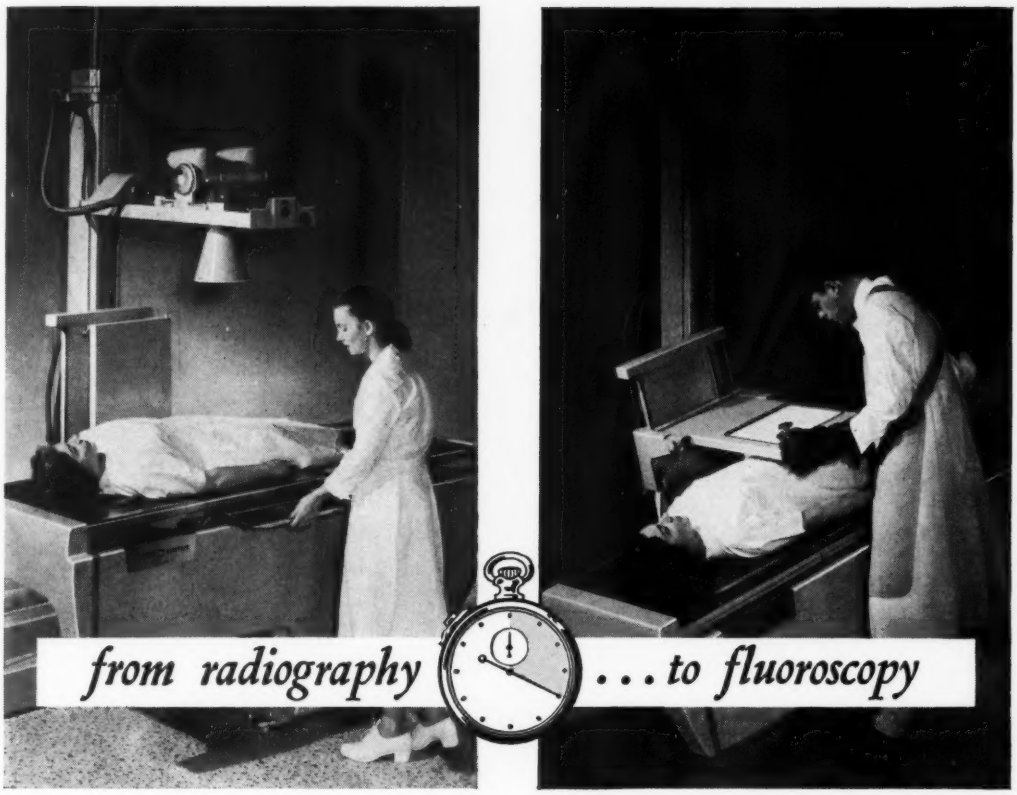

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Conventions and meetings

American Osteopathic Association, Sixty-First Annual Convention, Hotels Adolphus, Baker, and Statler, Dallas, Texas, July 15-19. Program Chairman, Neil R. Kitchen, 18820 Woodward Ave., Detroit.

Academy of Applied Osteopathy, annual meeting, Dallas, Texas, July 19-20. Program Chairman, Margaret H. Raffa, 5009 Central Ave., Tampa 3, Florida. Secretary, Margaret W. Barnes, P. O. Box 1345, Carmel, California.

American College of Osteopathic Internists, annual meeting, Hotel del Coronado, Coronado, Calif., September 26-28. Program Chairman, Delmar Daniel, 400 N. Glenoaks Blvd., Burbank, Calif. Secretary, Glennard E. Lahrson, 460 Staten Ave., Oakland 10, Calif.

Midwestern Clinical Conference, Hotel Continental, Kansas City, Missouri, April 26-28. Address Milton S. Steinberg, Osteopathic Hospital of Kansas City, 926 E. 11th St., Kansas City 6.

American College of Osteopathic Obstetricians and Gynecologists, annual meeting, Bellevue-Stratford Hotel, Philadelphia, February 18-20. Program Chairman, P. J. MacGregor, Jr., 706 J. M. S. Bldg., South Bend 1, Ind. Secretary, Harold K. Morgan, Lakewood Polyclinic, 7575 W. 14th Ave., Denver 15.

American College of Osteopathic Surgeons, annual meeting, Jefferson Hotel, St. Louis, October 27-31. Program Chairman, Don E. Ranney, 793 N. Renaud, Grosse Pointe Woods 36, Mich. Executive Assistant, Mrs. E. F. Martin, Box 474, Coral Gables 34, Fla.

American Osteopathic Academy of Orthopedics, annual meeting, Jefferson Hotel, St. Louis, October 27-31. Secretary, J. Paul Leonard, 2673 W. Grand Blvd., Detroit 8.

American Osteopathic College of Anesthesiologists, annual meeting, Jefferson Hotel, St. Louis, October 27-31. Program Chairman, Lawrence Everett Giffen, 209 Monroe St., Jefferson City, Mo. Secretary, Crawford M. Esterline, Box 155, Kirksville, Mo.

American Osteopathic College of Radiology, annual meeting, Jefferson Hotel, St. Louis, October 27-31. Secretary, F. A. Turfler, Jr., South Bend Osteopathic Hospital, 118 S. William St., South Bend 2, Ind.

American Osteopathic Hospital Association, annual meeting, Jefferson Hotel, St. Louis, October 26-30. Executive Secretary, Mr. R. P. Chapman, 604 Kahl Bldg., 326 W. Third St., Davenport, Iowa.

American Osteopathic Society of Proctology, annual meeting, Hotel Statler, Detroit, April 3-5. Program Chairman, John A. Brandon, 1814 Oberlin Ave., Lorain, Ohio. Secretary, Carl S. Stillman, Jr., 3523 Fifth Ave., San Diego 3, Calif.

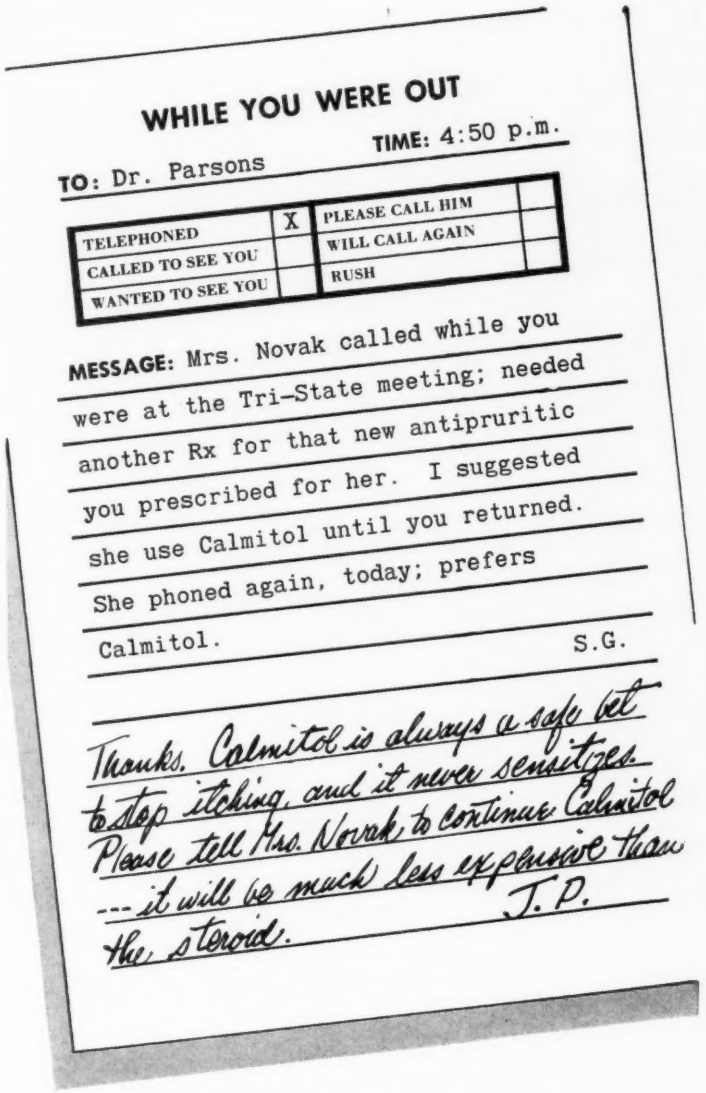
Osteopathic College of Ophthalmology and Otorhinolaryngology, annual meeting, Statler-Hilton Hotel, Dallas, Texas, September 23-25. Executive Secretary, Clifford C. Foster, 1388 Gladys Ave., Lakewood 7, Ohio.

Arizona, annual meeting, Wigwam Hotel, Litchfield Park, April 25-28. Program Chairman, R. D. Bennett, 115 W. First St., Mesa. Secretary, Homer E. Allhouse, 2243 N. 12th St., Phoenix 22.

Arkansas, annual meeting, Albert Pike Hotel, Little Rock, April 18-19. Program Chairman, Eugene M. Sparling, 222 Thompson Bldg., Hot Springs National Park. Secretary, John K. Rye, 812 S. Greenwood Ave., Ft. Smith.

California, annual meeting, Hotel del Coronado, Coronado, May 15-19. Executive Secretary, Mr. Thomas C. Schumacher, 1298 Wilshire Blvd., Los Angeles 17.

Eastern Osteopathic Association, annual meeting, Hotel Statler, New York City, March 23-24. Program Chairman,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Chester D. Losee, 212 Prospect St., Westfield, N.J. Secretary, Frank B. Tompkins, 309 Baltimore Life Bldg., Baltimore 1, Md.

Florida, annual meeting, Jacksonville, September 30-October 2. Program Chairman, Louis J. Larmoyeux, 124 E. Ashley St., Jacksonville 2. Secretary, Dominic Raffa, 5009 Central Ave., Tampa 3.

Georgia, annual meeting, King and Prince Hotel, St. Simons, May 9-11. Program Chairman, Walter B. Elliott, Jr., 702 Mortgage Guarantee Bldg., Atlanta 3. Secretary, Ruth McNeff Glass, 1432 Donnelly Ave., S.W., Atlanta 10.

Illinois, annual meeting, Hotel Sherman, Chicago, April 26-28. Program Chairman, S. V. Robuck, 25 E. Washington St., Chicago 2. Executive Secretary, Mr. D. O. Durkin, Rm. 521, 53 W. Jackson Blvd., Chicago 4.

Indiana, annual meeting, Marott Hotel, Indianapolis, May 19-21. Program Co-chairmen, Paul van B. Allen, 1500 N. Delaware St., Indianapolis 2, and H. E. Rinne, 519-20 Merchants Bank Bldg., Indianapolis 4. Secretary, Arabelle B. Wolf, 4840 N. Michigan Rd., Indianapolis 8.

Iowa, annual meeting, Savery Hotel, Des Moines, May 27-28. Program Chairman, R. S. Farran, Badgerow Bldg., Sioux City 9. Secretary, Mr. Herman W. Walter, 200 Walnut Bldg., Des Moines 9.

Kansas, annual meeting, Town House, Kansas City, May 4-8. Program Chairman, V. R. Cade, Cade Clinic Bldg., 816-818 Broadway, Larned. Secretary, Mr. Lloyd L. Hall, 121 E. 8th St., Topeka.

Kentucky, annual meeting, Brown Hotel, Louisville, October 16-17. Program Chairman, Paul E. Dunbar, 2505 Cherokee Highlands, Paducah. Secretary, Martha Garnett, 2829 Brownsboro Road, Louisville 6.

Maine, annual meeting, Samoset Hotel, Rockland, June 27-29. Professional Education Chairman, Donald P. Miller, Main St., Norridgewock. Secretary, Roswell P. Bates, 72 Main St., Orono.

Michigan, annual meeting, Grand Rapids, September 30-October 2. Program Chairman, Harold W. Laidlaw, McCoy-Laidlaw Clinic, Bad Axe. Secretary, P. Ralph Morehouse, 214 S. Superior St., Albion.

Midwestern Clinical Conference: See American College of Osteopathic Internists.

Minnesota, annual meeting, Lowry Hotel, St. Paul, May 2-4. Program Chairman, M. Sidney Hedeen, 1595 Selby Ave., St. Paul 4. Secretary, E. R. Komarek, 301 Granite Exchange Bldg., St. Cloud.

New Jersey, annual meeting, Ritz-Carlton Hotel, Atlantic City, March 2-3. Program Chairman, Kirk L. Hilliard, 850 N. Main St., Pleasantville. Secretary, Richard F. Leedy, 38 Newton Ave., Woodbury.

New Mexico, annual meeting, Navajo Lodge, Ruidoso, May 16-18. Program Chairman, Lory Baker, 400 N. Church St., Las Cruces. Secretary, Robert E. Smith, 205 N. First, Lovington.

Northwest Osteopathic Convention, Multnomah Hotel, Portland, Oregon, June 17-20. Program Chairman, Russell F. Kenaga, 2265 W. Burnside St., Portland 5, Ore.

Ohio, annual meeting, Neil House Hotel, Columbus, May 5-8. Program Chairman, Donald Siehl, 701 Salem Ave., Dayton 6. Secretary, Mr. William S. Konold, 53 W. Third Ave., Columbus.

Ontario, annual meeting, Orillia, May 2-4. Program Chairman, C. V. Hinsperger, 806 Canada Bldg., Windsor. Secretary, A. V. DeJardine, 205 Yonge St., Toronto 1.

Oregon: See Northwest Osteopathic Convention.

Pennsylvania, annual meeting, Chalfonte-Haddon Hall Hotels, Atlantic City, New Jersey, September 12-14. Program Chairman, Robert Friedman, 1201 Walnut St., Allentown. Executive Secretary, Mr. George W. Thomas, 1941 Market St., Harrisburg.

South Dakota, annual meeting, Huron, June 2-3. Program Chairman, F. A. Nutter, Jr., Box 368, Beresford. Sec-

retary, Earl W. Hewlett, 417 W. 27th St., Sioux Falls.

Tennessee, annual meeting, Graystone Hotel, Gatlinburg, April 28-May 1. Program Chairman, L. D. Elliston, 707 S. Main St., Covington. Secretary, J. W. Moore, Jr., 200 High St., Trenton.

Texas, annual meeting, Plaza Hotel, San Antonio, May 2-4. Program Chairman, Myron S. Magen, 5101 Ross Ave., Dallas 6. Secretary, Phil R. Russell, 512 Bailey St., Fort Worth 7.

Washington: See Northwest Osteopathic Convention.

West Virginia, annual meeting, Daniel Boone Hotel, Charleston, June 2-4. Program Chairman, Frank E. Pick, 4410 McCorkle Ave., S.W., South Charleston 3. Secretary, Guy E. Morris, 542 Empire Bank Bldg., Clarksburg.

Western States Osteopathic Society of Proctology, annual meeting, Riviera Hotel, Las Vegas, Nevada. Program Chairman, Marcus S. Gerlach, 2015 State St., Santa Barbara, California. Secretary, Earle F. Waters, 925 E. South Temple St., Salt Lake City 2, Utah.

Wisconsin, annual meeting, Wisconsin Hotel, Milwaukee, April 29-May 1. Program Chairman, I. J. Ansfield, 1500 E. Brady St., Milwaukee 2. Secretary, Edwin J. Elton, 1518 N. 70th St., Wauwatosa 13.

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State and national boards

ARIZONA

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Basic science examinations March 19 at the University of Arizona, Tucson. Applications must be filed 2 weeks prior to examination. Address H. D. Rhodes, Ph.D., secretary, Basic Science Board, University of Arizona, Tucson.

COLORADO

Basic science examinations March 6-7 and May 1-2, Y.M.C.A. Bldg., E. 16th Ave. and Lincoln St., Denver. Applications must be filed by February 20 and April 17, respectively. Address Esther B. Starks, D.O., secretary, Basic Science Board, 1459 Ogden St., Denver 18.

CONNECTICUT

Professional examinations March 12-13. Applications must be filed by February 26. Address Frank Poglitsch, D.O., secretary, Osteopathic Examining Board, 300 Main St., New Britain.

DISTRICT OF COLUMBIA

Basic science examinations April 22-23, 1740 Massachusetts Ave., N.W., Washington. Applications must be filed on or before April 1. Address Mr. Paul Foley, Deputy Director, Dept. of Occupations and Professions, 1740 Massachusetts Ave., N.W., Washington 6.

ILLINOIS

Examinations April 1-4 in Chicago. Address Mr. Frederic B. Selcke, Superintendent of Registration, Department of Registration and Education, State House, Springfield.

IOWA

Basic science examinations April 9 at the Capitol Bldg., Des Moines. Address Ben H. Peterson, Ph.D., secretary, Board of Basic Science Examiners, Coe College, Cedar Rapids.

MICHIGAN

Basic science examinations May 10-11. Address Mrs. Anne Baker, secretary, Board of Examiners in the Basic Sciences, 116 Mason Building, Lansing.

MINNESOTA

Basic science examinations April 2-3. Address Raymond N. Bieter, M.D., secretary, Board of Examiners in the Basic Sciences, 105 Millard Hall, University of Minnesota, Minneapolis 14.

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Crude fiber	3.0
Soluble carbohydrates	50.5
Protein	3.5
Fat	0.5
Minerals	2.0
Moisture	3.5

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MONTANA

Examinations March 5. Address Asa Willard, D.O., secretary, Board of Osteopathic Examiners, Wilma Bldg., Missoula.

NEBRASKA

Basic science examinations May 7-8. Address Mr. Husted K. Watson, director, Bureau of Examining Boards, Department of Health, State Capitol Bldg., Lincoln 9.

NEVADA

Basic science examinations April 2. Address Donald G. Cooney, Ph.D., secretary, Board of Examiners in the Basic Sciences, Box 9005, University Station, Reno.

NEW HAMPSHIRE

Examinations March 13-14. Address John S. Wheeler, M.D., secretary, Board of Registration in Medicine, State House, Concord.

NEW MEXICO

Basic science examinations April 21. Address Mrs. Marguerite Cantrell, secretary, Board of Examiners in the Basic Sciences, P.O. Box 1522, Santa Fe.

NEW YORK

John R. Pike, D.O., Albany, has been reappointed to the State Board of Medical Examiners for a term which will expire July 31, 1959.

RHODE ISLAND

Professional examinations April 4-5. Address Mr. Thomas B. Casey, Administrator of Professional Regulation, 366 State Office Bldg., Providence.

Basic science examinations May 15. Applications must be filed 21 days in advance. Address Mr. Casey.

TENNESSEE

Examinations in February and July at Nashville. Applications must be filed 15 days prior to examination. Address M. E. McCoy, D.O., secretary, Board of Examination and Registration for Osteopathic Physicians, 1226 Highland, Jackson.

L. D. Elliston, D.O., of Covington, has been appointed to the Board of Examination and Registration for Osteopathic Physicians, for a 5-year term.

WISCONSIN

Basic science examinations Saturday, April 6, 8:00 a.m. at Hotel Loraine, Madison. Applications must be filed by March 29. Address Mr. W. H. Barber, secretary, State Board of Examiners in the Basic Science, Ripon College, Ripon.

ALBERTA

Examinations in April. Address Mr. G. B. Taylor, Acting Registrar, Alberta Medical Board, Office of the Registrar, University of Alberta, Edmonton, Canada.

Specialty board examinations

ANESTHESIOLOGY

Examination October 26, 9:00 a.m., Sheraton-Jefferson Hotel, St. Louis, Missouri. Address Crawford M. Esterline, D.O., secretary. American Osteopathic Board of Anesthesiology, P.O. Box 155, Kirksville, Missouri.

PATHOLOGY

Examination July 12, 9:00 a.m., Dallas Osteopathic Hospital, Dallas, Texas. Address Norman W. Arends, D.O., secretary, American Osteopathic Board of Pathology, 13119 Sherwood Drive, Huntington Woods, Michigan.

PEDIATRICS

Examinations July 9-12 in Dallas, Texas. Address Evangeline N. Percival, D.O., secretary, American Osteopathic Board of Pediatrics, 1721 Griffin Ave., Los Angeles 31, California.

PROCTOLOGY

Examination July 13 in Dallas, Texas. Address Carlton M. Noll, D.O., secretary, American Osteopathic Board of Proctology, Box 47, Evergreen, Colorado.

SURGERY

Examinations October 26-27 in St. Louis, Missouri. Applications for examination in specialty fields of surgery, gynecological surgery, neurosurgery, orthopedic surgery, peripheral vascular surgery, plastic surgery, urological surgery must be received prior to April 1. Address Mrs. E. F. Martin, corresponding secretary, American Osteopathic Board of Surgery, P. O. Box 474, Coral Gables, Florida.

Reregistration of osteopathic licenses

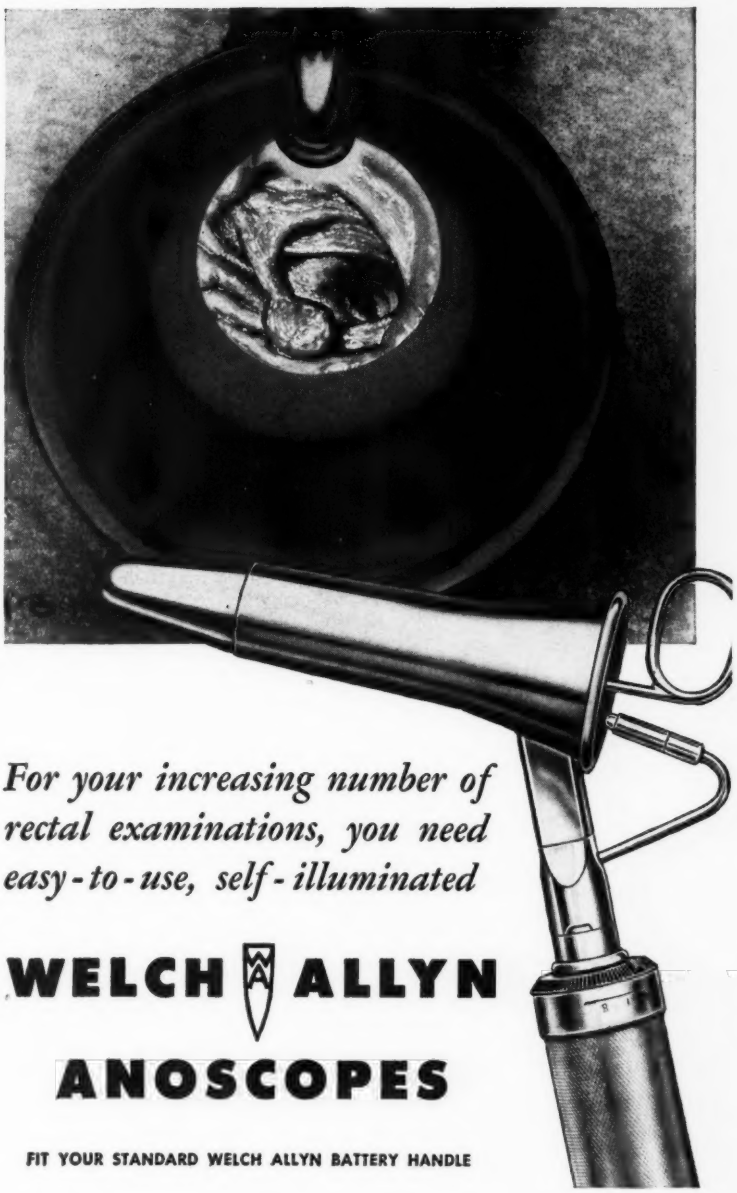
Before March 1—Colorado, $2.00 if legal resident of Colorado; $10.00 if not legal resident of Colorado. Address Mrs. Beulah H. Hudgens, executive secretary, Board of Medical Examiners, 831 Republic Bldg., Denver 2.

April 1—Montana, $2.00 for those in active practice, $1.00 for those inactive. Address Asa Willard, D.O., secretary, Board of Osteopathic Examiners, Wilma Bldg., Missoula.

April 1—Wyoming, $2.50. Address Franklin D. Yoder, M.D., secretary, Board of Medical Examiners, New State Office Bldg., Cheyenne.

May 1—Iowa, $1.00. Address Mr. Herman W. Walter, assistant secretary, Board of Osteopathic Examiners, 200 Walnut Bldg., Des Moines 9.

May 1—Washington, $2.00. Address Mr. Edward C. Dohm, secretary, Professional Division, Department of Licenses, Olympia.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Examination by National Board

The National Board of Examiners for Osteopathic Physicians and Surgeons conducts Parts I and II of its examination on the first Thursday and Friday of each May and December at the six approved colleges. Application blanks may be obtained from the secretary or the dean of the college, and the completed application blank, together with a passport photograph and check for the parts to be taken, must be in the secretary's office by the November 1 or April 1 preceding the examination.

Examinations in Part I consist of anatomy, including histology and embryology; physiology; physiological chemistry; general pathology; and bacteriology, including parasitology and immunology.

Part II consists of examinations in surgery, including applied anatomy, surgical pathology, and surgical specialties; obstetrics and gynecology; pediatrics, neurology and psychiatry; public health, including hygiene, medical jurisprudence; osteopathic principles, therapeutics, including pharmacology and materia medica.

Part III is an oral and practical examination given under the supervision of a chief examiner who is a member of the Board and by a panel of associate examiners. Subjects covered in Part III are anatomy; physiology; pathology; osteopathic principles; therapeutics, and pharmacology; surgery; ophthalmology and otorhinolaryngology; obstetrics and gynecology; physical and clinical diagnosis; public health and communicable diseases.

These are oral examinations which the candidate may take after having satisfactorily completed the first 6 months of a 1 year internship in a hospital approved by the American Osteopathic Association for intern training. Part III is given annually at the Philadelphia, Kirksville, and Los Angeles colleges.

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1. Blank, P., and Boas, H.: Ann. West. Med. & Surg. 6:376, 1952.
2. Piper, C. E., and Nicklas, F. W.: Indust. Med. 23:510, 1954.

*U.S. Pat. 2,628,185

Eligibility requirements are as follows: Part I, satisfactory completion of the first 2 years in an approved school of osteopathy; Part II, satisfactory completion of Part I and of the first two quarters or trimesters of the senior year in an approved osteopathic college; Part III, satisfactory completion of Part II and at least 6 months of a 1-year internship approved by the American Osteopathic Association. The internship requirement does not apply to candidates who took Part I prior to July, 1950.

Applications must be filed with the secretary of the Board not less than 30 days prior to the examination dates. Address Paul van B. Allen, D.O., secretary, 1512 N. Delaware Street, Indianapolis 2, Indiana.

Trends in gerontology*

William B. Kountz, M.D.†

What is gerontology? We might say that it is an understanding of the process of aging, or a form of therapy, or a form of evaluation of the problem of aging. All these are true in their own way, but, actually, gerontology is a cumulative process of thinking in regard to one of the important problems of existence. Gerontology is indeed a broad word, covering many facets of our existence.

Much like medicine itself, gerontology had to create a logical place in the human mind before it could be established. Since thought develops slowly and in stages, the most critical point is usually the one considered first by the mind. Because of the need, generations ago, for attention to the health of the younger individual, the problems of the early years of life were attacked most vigorously and the science of pediatrics was established. It was only after the application of this direction of study and observation of the results that the problems of the period past midlife became critical in the mind of man. We are now at the stage where gerontological control in all its different phases and aspects looms high as one of the greatest needs of mankind.

Since gerontology is divided into different units, or disciplines, we shall consider each one separately.

BIOLOGY

Since there is definite biological change in everyone from his unicellular state to maturity, the biological problem is important not only in the period of growth and development, but also in maturity and later years. In considering the biological aspect of aging, there are a number of questions that must be asked: Is the body as it ages fixed in its principle so that the changes cannot be modified? Should we expect biological change to be comparable to the process of boiling an egg? Can such anatomical and functional changes as occur with age be modified?

These questions have been answered definitely. It has been shown that there may be a reversal in the picture of tissue, both biologically and functionally, long after the tissue has ceased its normal activity, that actually the functional capacity of the tissue may be returned to near normal and the biological appearance of the cells and tissues may again approach that of younger periods of life. Since this can be demonstrated in certain tissues, it is highly possible that other tissues may be modified in both their functional capacities and anatomical appearance.

It has been shown that the epithelium of the nose and throat may again develop cilia and that an improvement of this tissue may occur after the functional capacity of the mechanism has been greatly reduced. It has been demonstrated that the endometrium of the uterus may be returned to a state resembling its former state in anatomical appearance and even, in part, in function. With proper therapy, the blood vessels of the uterus may even tend to lose their calcification, which was due to arterial strain. It has been demonstrated that the mental response of a patient may be improved, that such things as memory, ability to coordinate thought, judgment, and the like, may be benefited by therapy. We

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†Dr. Kountz is assistant professor of clinical medicine, Washington University School of Medicine, St. Louis, Mo.

can say that the biological function and physical tissue may be modified and that they parallel one another. This phase of gerontology needs much research, and much may be accomplished by proper study and evaluation.

Can and should these changes be modified? From my limited experience I feel that knowledge will lead to a definite modification of tissue and its function, which will in turn extend the health of older people. Many of the diseases found in older people are attributed to arteriosclerosis, but since the advent of pathology physicians have found that a clinical diagnosis of arteriosclerosis is not always substantiated by autopsy findings. Children died of diarrhea, which was later found to be preventable by control of the nutritional state of the infant. The trend in biological study is upward, but the ascent is very slow.

PSYCHOLOGY

There are so many factors that influence the psychology of the older person that it is difficult to evaluate them briefly. The need for a better adjustment of the older person to his environment, the need for economic, social, and medical security, all enter into the mental and emotional disturbance of his existence. Control of these factors leads to a healthier outlook on life, to a better understanding of the emotions, and must come through proper education of the individual and a realization of his part that aging is not something to be shunned, but something to be accepted and adjusted to. As most of our youngsters are taught, so should our oldsters be taught that they must prepare themselves for the future in order to have a pleasant corner in life at any age.

There is an increasing realization of the need to develop this thought. I can point particularly to the University of Michigan, which has taken the lead in the control of the psychological aspect of older people. The institution is well known for studies concerning the mental health, the emotional needs, the adjustment to an industrial program, and the education of the older person. Proper thinking in the field of psychology of the aging by the leaders is well assured. Administration of this thought to those who need it is, of course, difficult. It must come with education of the masses of older people. The trend toward proper evaluation in the field of psychology is strong.

CLINICAL MEDICINE

Clinical medicine has for generations shied away from the subject of gerontology and is still doing so. Few medical schools teach any of its principles. Few of the teachers in the schools realize its importance, and consequently few teach medical students and interns the problems of aging, particularly the anticipation of disease. They sack up most diseases that occur in older people and call them arteriosclerosis and shake their heads and say: It is inevitable. There is an awakening of thought in the direction that some of the changes that occur with age may be modified and that basic underlying changes which lead to the diseases of the older person may be recognized and treated. However, the problems of geriatric medicine have not yet received proper recognition.

This trend in clinical medicine is a sort of status quo. Many clinicians still think that illness must occur with age. Since they feel that a disease must occur before treatment is started, they are unable to approach the prophylaxis of gerontology. They are unwilling to anticipate that illness may occur unless something is done to direct and control the body functions. It is important to emphasize that acute phases of chronic disease do not occur suddenly; rather they progress slowly and have their existence as a result of changes that began long before the acute phases developed. Internal medicine needs to take a page out of the book of pediatrics from the standpoint of prophylactic and anticipatory medicine.

Nevertheless, the clinical state of the older patient has been much improved. Many types of conditions that frequently lead to chronic diseases are now controllable. For instance, hypertension, or high blood pressure, has been brought under control to a great extent in the past few years, a fact that will doubtless help to prevent illness in many oldsters. The understanding of dietary problems, such as the influence of fats in the control of arterial disease, and the understanding of the nutrition of the body likewise play

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an important part in the control of chronic disease. Surgery, with its ability to replace diseased blood vessels, leads to improved health in the older person. The early recognition and surgical treatment of cancer of the breast, the uterus, and the lung also help to extend health into the later years of life. And much could be said about the introduction of medications and techniques in specific disease, all of which lead to better health.

The trend in the clinical aspect of the control of disease in older people is definitely upward, but there is still need for earlier recognition and earlier clinical evaluation before prevention of disease can come into its own. The treatment and control of disease in older people has been much improved, and the trend to better health is a trend to a brighter outlook.

OTHER ASPECTS

The social, economic, and religious aspect of life for older persons vary a great deal from these aspects of life for young people. The social aspect is often modified by a change in clinical health, in economic ability, and particularly in the psychological outlook of older individuals. That social needs should be recognized and social adjustment aided there can be no doubt. The trend is in this direction: for example, social security, old age pensions, and housing projects for the aged. Fraternal organizations and other groups are beginning to make moves toward meeting the needs of their retired members. In my experience the social aspect is always conditioned by psychological and clinical health. Those in poor health need social adjustment and social help; those in good health maintain their own level.

Another trend of great importance is the increasing concern among lay people with the results of gerontological research. If propertly directed, their interest can speed the progress of gerontology. It will serve to create a demand on scientists and physicians to develop the knowledge necessary to assure health in the later years. This emphasizes the need for the formation of foundations to help develop further study and to establish funds for research, as well as to permit the expression of lay people in the field. This type of organization enables the layman and the scientist to become partners in gerontological research, and no more important a relationship can be established. One such organization, the Gerontological Research Foundation, has already been set up.

Psychological limitations that occur with age*

James E. Birren, Ph.D.†

The purpose of this paper is to describe a few limitations that may occur with age and to draw some preliminary inferences about the underlying mechanisms. The scientific literature on the psychological aspects of aging is increasing. The contributions from the Cambridge Laboratory in England[1-4] and the publications of numerous investigators in this country have given us many facts to digest. Recently, reviews have appeared on special aspects of aging, such as psychomotor changes, changes in mental abilities, and changes in personality.[5-7] Many summaries of the literature were presented at the Bethesda Research Conference on the Psychological Aspects of Aging.[8] With this factual background in mind, it is proper that we begin to consider some of the general mechanisms which may underlie the psychological limitations of aging.

It is implicitly assumed that from considerations of basic facts and information suggestions will become apparent for the prophylaxis and alleviation of many

*Reprinted from *Public Health Reports*, December 1956.

†*Dr. Birren is chief of the Section on Aging, Laboratory of Psychology, National Institute of Mental Health, Public Health Service, Bethesda, Md.*

of the limitations which occur with age. Because we use the term "limitations of aging," it should not be assumed that aging is inevitably linked with limitations. The advantages associated with advancing age, like those of growth, take care of themselves, but limitations and defects do not. To these we must direct the knowledge of our sciences and professions if we are to increase the number of healthy, happy, informed, and independent older persons.

A POINT OF VIEW

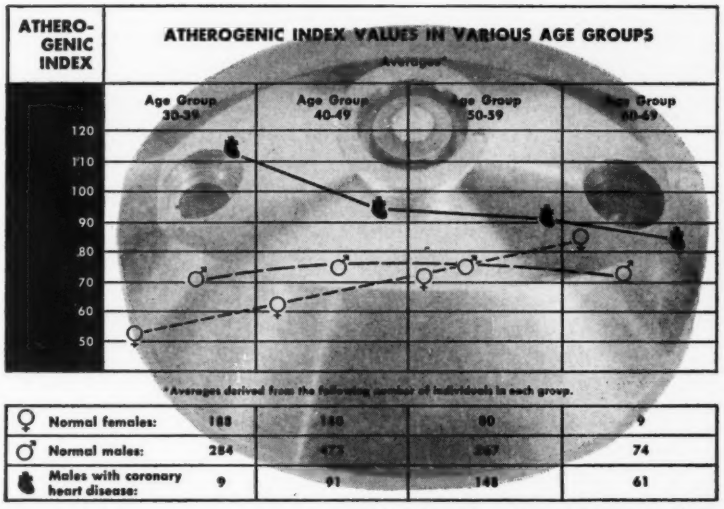
There are two psychologies to be considered in relation to limitations of aging. One is clinical and is concerned with diagnostic, therapeutic, rehabilitative, and supportive procedures. The other is directly concerned with research or experimentation on mechanisms of aging. The point of view adopted in this paper is that of research. We are seeking explanatory principles that might begin to link the now disparate facts about aging.

Generalization vs. Individual Differences

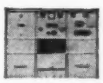
For many psychological and biological processes, about 50 per cent of the variation in the data is explained by the general age trend. Thus, in many studies, the range of individual differences is about equal to the magnitude of the mean trend. Whether we emphasize the general trend in our psychological or biological data or the range of individual differences depends upon our purposes. The clinician is more often interested in the uniqueness of the individual under study than in the general characteristics he shares with other people. The biologically minded psychologist is more often concerned with an analysis of the general characteristics. Both the general trend and the range of individual differences are proper subjects for study.

An Emerging View

As individuals, we are continually concerned with an emerging point of view toward human aging, that is, the proper combination of generalizations with specific facts from personal experience. At some point the experimenter joins with the clinician and with informed people in general to give an appropriate weighting or perspective to the facts of psychological limitations in aging. But what facts should be emphasized? Should we emphasize that there appears to be a disparity between the observable anatomical changes of aging of the nervous system and the changes seen in individual behavior and personality? If this is emphasized, we encourage acceptance of or complacency about our lack of knowledge concerning the relations between psychological functions and the structures of the nervous system. It does not appear to be sound mental health to encourage the idea that successful aging is entirely a voluntary phenomenon and that all older people are capable of doing outstanding things if they would only try. The mature point of view toward human aging seems to represent a balance between optimism and realism and an avoidance both of excess voluntarism and of undue stress on the limitations of aging.



Adapted from Gofman, J. W., and others: Med. Med. 21:119 (June 15) 1952.



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SPEED IN TIMING OF HUMAN BEHAVIOR

Perhaps the most significant result of research on age changes in the nervous system in the past 10 years is the implication that there is a general slowing of all voluntary responses. In a previous review it was pointed out not only that the slowing of voluntary responses with age is an overt manifestation but also that there is evidence of slowing of covert responses in aging, such as speed of associations of thought.[9] The change in response latency appears to be our most fruitful point of departure for exploring the nature of age changes in behavior and perhaps for the significance of the age changes in the structures of the nervous system.

In young adults individual differences in speed seem to have only limited psychological importance. In aging, however, individual differences in speed or response latencies seem to be an important independent variable for the psychologist to consider. Recent research suggests that the time delay between stimulation and response is primarily a property of the central nervous system, whereas earlier research tended to minimize the importance of time differences that might be observed in simple and

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1. Bradley, J. E.: Mod. Med. 20:71, No. 20, 1952.

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choice reaction time measurements. The slowing with age has to some extent been viewed as an arbitrary or artifactual aspect of performance of the older person. Implicit in such a view is the assumption that the slowing occurs only in the response or output mechanisms and is unrelated to the speed or the quality of events preceding the initiation of response. Were the loss of speed with age a peripheral phenomenon, it would of course be of limited psychological interest.

Simple speed tests seem to differentiate more clearly between senile psychotic individuals and control subjects than do various combinations of rather complex mental tasks. For example, a 2-minute writing test was found to differentiate senile patients and control subjects.[10] In contrast, a 1½-hour psychometric test designed to measure deterioration did not yield such differentiation. Again, later studies showed that this difference was not simply a peripheral limitation on the writing speed, but that the speed of writing was correlated with the probability of the antecedent events being correct.[11]

What requires the additional time in the older nervous system? Does a time-lag occur in the retina or in the optic nerve? Is there an increased latency in the primary sensory projection area of the brain or in an association area? Is additional time required in programing appropriate motor responses in the motor cortex or in the spinal cord? Does the peripheral nerve or the myoneural junction require more time in its functions?

It was originally thought that older people adopted a slow tempo of response. Hence the increased latencies of voluntary responses were not viewed as a reflection of reduced capacities of the nervous system but phenomena of attitude or set. It has now been shown that at least in one other species, the rat, a slowing of response latency occurs with age. In a recently published study of startle responses of rats of different ages, it was shown that for older rats there is an increase in response time to electric shock and to sudden noises.[12] Furthermore, when attempts were made to decrease the response time of these animals by increasing the electric shock, a minimum reaction time was reached beyond which a further increase in the stimulus strength did not result in a further reduction in reaction time. At this plateau, or asymptotic level, of response, there was a residual difference between young and old animals.

An experimental attempt was also made to see to what extent the slowing with age could be related to conduction velocity of peripheral nerve in the rat. In this study the conduction velocity was measured in isolated sciatic nerve excised from more than 75 rats ranging in age from 50 to 850 days.[13] Conduction velocity increased during development, but it did not change significantly after about 300 days. The results of that study taken together with results of previously reported studies indicate that changes in peripheral nerve do not appear to be important in the changes which we see in such functions as simple reaction time in later life.[9,14]

Recent and unpublished studies by Dr. Alfred Weiss of the National Institute of Mental Health and by Dr. Botwinick, also with the institute, and myself have found no evidence as yet that the age changes in the speed of human voluntary response to any large extent lie in either the receptor or in the effector processes. An earlier study by Johannes Sommer indicates that the age change in a simple spinal reflex in the human is small; it seems to be of the order of perhaps 1 millisecond compared with the 50 or more milliseconds that differentiate the voluntary responses of a young and an older person.[9]

The recent work of Kumnick on pupillary responses to light indicates that under some circumstances the latency is unchanged with age. This implies that at least under some conditions the rapidity of all the events, from the stimulation of the receptors in the eye to the effecting of pupillary constriction, must be unchanged with age. Apparently, the older pupil constricts at a normal rate in proportion to its smaller size. Since the older pupil is usually somewhat smaller, it may, however, give the illusion of a slower response. If this rather complicated reflex remains unchanged in later life, we might speculate that some of the purely sensory components are

also unchanged in relation to latency of perception and the initiation of voluntary responses.

Apparently, the decrease in speed of voluntary responses with age is primarily a phenomenon of the central nervous system and conscious behavior. This provokes a dilemma because the physiological methods which might be appropriate to a study of the phenomenon are ones which are so artificial (for example, anesthetizing the organism) that they preclude studying manifestations in the conscious state. The problems lie in an experimental area wherein the relevant types of experimentation and variables are familiar to the experimental psychologist, and the inferences lie in the domain of the neurophysiologist.

A depressed person might respond slowly and yet retain a capacity to respond quickly, whereas it is extremely doubtful that the older organism maintains the capacity for rapid response. Responses of the elderly are made at some uniformly slow rate.[15] This suggests that we might speak of less "temporal modulation" of voluntary responses. Implications of this concept are important in attempts to define the environment wherein the older person would be most comfortable. In general, the older person is most comfortable in a situation in which he can pace his responses and is least comfortable in one in which he must respond quickly to demanding sequential stimuli. Rapid sequential stimuli occur, for example, in automobile driving. This situation is not revealed satisfactorily by an analogy to a simple reaction-time experiment. Recent findings in our laboratory show that there is a difference in readiness to respond in the elderly as compared with the young. Different age curves were obtained for changes in response time as a function of preparation. It is not possible to say at this time whether the lower level of response readiness or expectancy is independent of the increased latency or is a different manifestation of a common underlying change in the character of nervous system functioning. Also, we do not yet know whether complex tasks merely show a multiplicative effect of the longer latencies. Again it may be that the same basic process is simply disproportionately represented in a complex situation.

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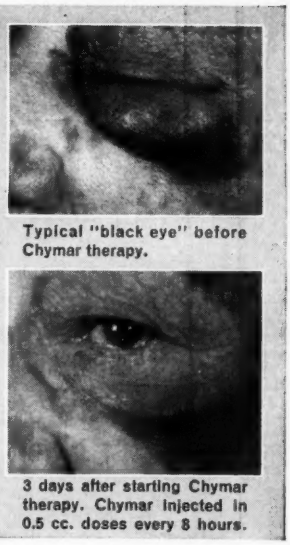

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SERIAL MOVEMENTS IN TIMING

There is evidence that one of the limitations older persons face is difficulty in timing sequential events. Kay pointed out that his learning experiments suggest that with advanced age some individuals display a difficulty in "programing" sequential movements.[1] This was noted also in earlier work on age changes in handwriting. In some aged individuals handwriting tends to become a series of discrete movements, instead of a smooth, overlapping of movements, that is, it becomes more like drawing. This is analogous perhaps to a change in a feedback mechanism wherein the older organism is unable to use the information obtained from the execution of a preceding movement to modify a following one or is unable to do so with sufficient speed. Singleton pointed out that the speed of movements, once the movements are initiated, is unchanged in older persons. What requires additional time with age is the decision points in movements.[2]

For optimum skill, the proper moment for initiating responses must be anticipated. Components of serial responses must be programed in advance to conserve time. If the response components are not anticipated or programed they appear as discrete events separated by delay intervals. A slowness in developing or programing future responses may limit the aged in the execution of some highly complicated skills, the essence of which is the flowing of activities or movements one into the other. It is perhaps highly relevant to note that, when a skill is first acquired, the component movements appear discrete and that, as the skill is improved, these movements are gradually combined into a continuous pattern. As a skill deteriorates, it may again assume the quality of separate movements. Timing seems to have a perceptual character, that is, one sees or feels the right moment to make a response. Difficulties exist when the signals come close together.

In the preceding remarks, the facilitation of voluntary response was emphasized. However, in the aging nervous system there may exist a general change

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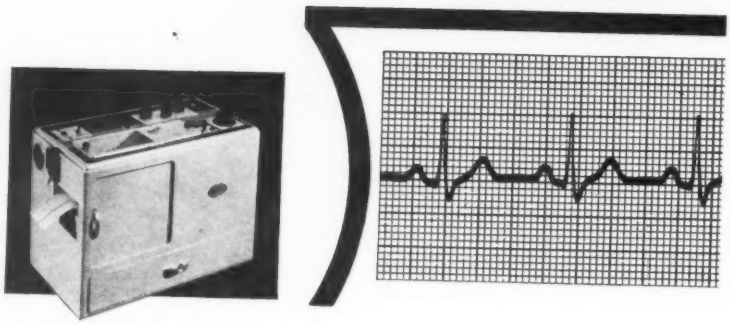

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in excitability which would be reflected in both facilitatory and inhibitory functions of the nervous system. Perhaps more common in daily life than a demand response to a stimulus is the situation in which the stimulus may be anticipated and received in advance of the appropriate moment for the response. Good timing may thus be more a matter of inhibiting the response until the proper moment than a matter of its facilitation. In aging there may exist a narrowing of the range between minimum response time and maximum response time. This topic requires more information than now exists about the length of delays which can be interpolated between sequential stimuli without the behaviors disintegrating or being forgotten.

Viewed from one aspect, the nervous system appears to be more determinate in the aged than in younger persons, that is, the output tends to be more directly a function of the input. There is, of course, a tendency to cultivate certain types of determinacy or redundancy, as in the social graces. It is of interest to note that the social facade may be the last bit of behavior to disintegrate in the senile individual. Our psychological data on aging should be sifted for influences of our cultural pattern that determine which areas of our behavior may be novel and which are expected to be predictable.

PERCEPTUAL DIFFICULTY

Perceptual difficulty, or inability to perceive information in order to achieve an appropriate response, may contribute to the age changes in behavior. One experiment attempted to see to what extent the response time of old and young people would vary as a function of perceptual difficulty.[36] Young and elderly subjects were required to judge which of two simultaneously presented lines was the shorter. The lines were presented tachistoscopically. Each subject made a minimum of 48 judgments in a series of line pairs which differed in length from 1 to 50 per cent. The subject was required to respond as quickly as he could when the lines were presented by saying "right" or "left" to indicate the side of the shorter line. The vocal response of the subject interrupted a chromoscope circuit, and his response time was measured to the nearest one-hundredth of a second. A significant difference in response time between the two age groups was found at all levels of difficulty of judgment. The response time of the elderly was relatively longer, however, when the stimulus difficulty was increased. Thus, the difference in response time between the young and the elderly subjects was 0.47 seconds at a 1 per cent difference in line length, whereas for a 50 per cent difference in line length the response time of the young and older subjects differed by 0.18 seconds. It is apparent that perceptual difficulty can contribute to the slower response of elderly subjects. However, there is a residual age difference in response time which exists regardless of the ease of the perceptual task involved.

Again, one might question whether a large part of this difference in response latency is not due simply to the difference in speed of vocalization. For this reason we conducted another experiment in which we studied age differences in finger, jaw, and foot reaction time to auditory stimuli.[34] The hypothesis was that, if a general factor were underlying the age change in response latency, we would get a constant increment in reaction time with the jaw, finger, and foot. If the age changes were primarily involved in the peripheral pathways, then the reaction time with the foot with its long pathways might be disproportionately slow as compared with the finger or jaw. In this study, the reaction time of the elderly subjects was significantly slower than that of the young subjects for the finger, jaw, and foot, but there was no relation to the length of the peripheral path involved. Since the age differences between the reaction-time means did not change significantly in comparing the finger, foot, and jaw, it may be concluded that the age change in reaction time is not a variable associated with the length of the peripheral path. Collectively, the evidence suggests that it is plausible to regard the age change in response latency as a general property of the central nervous system.

SUMMARY

For many psychological and biological processes there is a general age trend which in some instances explains about 50 percent of the variation in the data. There is an equally large range of individual differences. It depends upon our purposes whether we study and emphasize the general age trend or the individual differences in aging. Both the general age trend and individual differences are important.

Perhaps the most significant result of research on age changes in the nervous system is the implication that there is a generalized slowing of all voluntary responses. On the whole, the evidence indicates there are grounds for regarding the age change in response latency as a general property of the central nervous system. The longer response latencies appear to have their greatest consequence for complex or serial activities. The facts offer suggestions for further research into the bases of the changes, as well as for structuring the environment in order to reduce problems of living due to the psychological limitations of aging.

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Effect of multiple impairments on mortality*

Life insurance studies indicate that the mortality of persons with more than one impairment is generally adversely affected to a greater extent than the sum of the extra mortality associated with each impairment separately. Moreover, the extra mortality tends to be greatest where both impairments involve the same system or structure of the body.

An extensive study, which covered the experience of many Life insurance companies in the years 1935-50†, showed that among insured persons with murmurs heard at the apex of the heart—often indicative of a leaking valve—the mortality for those whose hearts were slightly enlarged was about 1½ times as high as for those with normal heart size; for persons with moderate cardiac enlargement at time of examination for insur-

*Reprinted from *Statistical Bulletin*, Metropolitan Life Insurance Company, October 1956.

†*1951 Impairment Study*, Society of Actuaries, April 1954.

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was found consistently at examination for Life insurance and who also had slight elevation of blood pressure, the mortality was more than one third higher than in those with normal pressure, and about twice as high in similar cases with moderate hypertension.

An earlier investigation of mortality among insured persons with abnormal blood pressure‡ considered the effect of different types of minor impairments associated with elevated blood pressure. The mortality among hypertensives with associated minor impairments was higher than for those otherwise unimpaired, especially for persons who were under age 50 when insured. The excess mortality increased with the degree of elevation of blood pressure, either systolic or diastolic. For example, among men at ages 30-39 years when insured, whose diastolic pressure was well above average—between 94 and 98 mm.—the mortality was 1½ times that for standard risks generally; for those who, in addition, had associated minor impairments, the mortality was two and one fifth times that of standard risks, and one and a half times that for the hypertensive cases without associated impairments. Similarly, for men at ages 40-49 when insured, the mortality of the group with minor impairments was more than one fourth higher than for those free of such impairments.

These findings underscore the need for the early detection and treatment of conditions usually considered of minor importance, particularly in persons with more than one impairment. They also emphasize the serious effect of several impairments on mortality. The periodic health examination is an excellent means of bringing to light not only minor impairments, but also serious conditions in their early stages, when they are most amenable to control.

‡*Blood Pressure Study, 1939*, and *Supplement to Blood Pressure Study*, Actuarial Society of America and The Association of Life Insurance Medical Directors.

ance, mortality was more than twice as high as for those with heart of normal size. Similarly, mortality was higher for persons with apical heart murmurs who had had rheumatic fever than for similar cases without a history of the disease.

Persons with rapid pulse, ranging from 90 to 100 a minute, who in addition had a minor impairment—in most cases slight overweight or slight increase in blood pressure over the average—experienced a mortality about one fourth higher than that for persons without an added impairment.

An outstanding finding of the study was a significantly higher mortality among policyholders who, on application for insurance, had reported two or more cases of cardiovascular-renal disease before age 60 in the immediate family than among persons without such family history. According to data from the Metropolitan Life Insurance Company, policyholders with a family history of early cardiovascular-renal disease who also had minor associated impairments experienced a distinctly higher mortality than those without such impairments. Where the minor impairments involved the cardiovascular-renal system, the mortality was almost double that for similar cases without associated impairments. The excess mortality was accounted for largely by the cardiovascular-renal diseases.

The 1951 Impairment Study showed also that among persons with albumin in the urine—a laboratory finding which may be indicative of impaired kidney function — mortality was significantly higher for those with above average blood pressure than for those with normal blood pressure; the mortality increased with the degree of hypertension. Thus, among those in whom albumin

Effects of child-rearing patterns on mental health*

Lois Barclay Murphy, Ph.D.†

We have more of almost anything you want to mention than any other country in the world—more property, more gadgets, more food, more science, more

*Based on a paper presented at the 1956 Forum of the National Conference of Social Work. Reprinted from *Children*, November-December, 1956.

†Dr. Murphy is Research Consultant, Department of Child Psychiatry, Menninger Foundation, Topeka, Kans.

medicine, more vitamins, more music, more school—but we don't have better mental health or freedom from problems.

Longitudinal studies like those of Jean MacFarlane[1] at Berkeley demonstrate for the generation she studied in a carefully selected sample that "behavior of the child's needs and of the relation of the culture problems," as we conceive them in professional work with children, are normal for normal children in a moderate-sized city. If by problems we mean enuresis, speech difficulties, tempers, nail biting, transitory lying or stealing, no child grows up without any problems. However, since these problems often bother parents more than children, and since they are often outgrown, they do not as such reflect seriously on our children's mental health.

Neurotic disturbances can be inferred only from prolonged or severe problems, an accumulation of more than one, interference in development, or a child's failure to participate in the life of his age group. Maladjustments to society, expressed in delinquency or character disorders, and the more blatant difficulties in growing up which we see in borderline-psychotic and psychotic children are rooted in multiple pathological conditions, interactions between vulnerability in the child, disturbance in the family, and other stressful experience.

It is a larger order to discuss child-rearing patterns in relation to all normal tension outlets and to all extreme threats to mental health. Such considerations are complicated further by the fact that child-rearing patterns are not fixed but vary from one area to another, and from one period to another.

The revolution in child-care patterns in the last 15 years testifies to the fluidity of our culture, its capacity for change, and the opportunity both provide for influencing the culture if we can be sure of our ground in doing so. Difficulties in being sure come from disillusionments resulting from one-sided views of the effects that given patterns have on child development. The rigid routines of feeding, toileting, and sleeping, advocated in the thirties, grew out of an oversimplified concept of conditioning plus pediatric concepts that dealt with nutrition and physical hygiene generally without regard to the emotional consequences of the techniques of imposing these routines. During the forties, there was a tendency to go to the opposite extreme. Both excessive coercion and excessive indulgence brought problems for children.

There is no guarantee that we won't make just as many mistakes in the future. But the best insurance against that seems to lie in developing as comprehensive and balanced a picture as possible of the child's needs and of the relation of the culture both to these needs and to the child's ability to satisfy them. It has taken dramatic and painful experience to force our attention to some of the most obvious interactions of culture and child needs. For instance, the studies[2] of Anna Freud, Bowlby, and Spitz are significant in relation to children's problems of separation not only in wartime but also in our peacetime patterns of babysitting, hospitalization, and frequent moving, which uproots little children from the home, neighborhood, and friends with whom they have tried to establish firm relationships.

Several absorbing new books[3] show us in very different ways how complex these interactions are and how many factors both in the culture and in the child are involved in thinking about child-rearing practices. To these I would add various significant studies[4] of factors involved in the development of anxiety and breakdown in reaction to stress in childhood.

A COMPLEX PHENOMENON

All these studies make clear that mental health is always mental health in *a given setting* with each setting's special demands, resources, stresses, and rewards. Mental health is also relative to the *kind of person* we are dealing with; there is no one standard of mental health for everyone. It is also relative to our *concept* of mental health. Children of headhunters learn ways of using their aggressive drives that are consistent with good mental hygiene in their culture but not in ours. Our child-rearing patterns and concepts of mental health have to be looked at in relation to the culture as a whole—its values, acceptable goals, and the things it disapproves or won't stand for.

Child rearing includes all the cultural influences within and without the family that condition and canalize the child's

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energies—emotional, motor, intellectual, and so on. Physiological levels of conditioning by feeding and toilet-training experiences are among the first and are very important, but they become interwoven with, offset by, and overlaid by many other levels which are influenced not just by the mother, or even by the family as a whole, but by the whole neighborhood and larger culture as it impinges on the child. For example, one child we studied was quite free from early toilet-training pressure, but when the family moved into a new neighborhood the other children and parents laughed at her because, at 2, she was still wearing diapers. At the Sarah Lawrence College Nursery School in the late thirties and early forties, there were many children whose mothers began toilet training "too early" but who were still happy children, doubtless because they were enjoyed, cared for tenderly, and loved.

In addition to watching the family and the culture as a whole, we need to give separate consideration to the positive and negative aspects of the problem: building mental health and preventing mental breakdown, as well as the remedial approaches needed to handle breakdown when it occurs. Building mental health is a matter of building areas of satisfying life in warm relationships with people, and in work and play[5] and in *building ways of solving inner and outer problems.* Preventing mental breakdown is a matter of preventing cultural stress beyond the point that can be handled by individuals, and along with this, *increasing the individual's capacity to cope with stress.* Remedial approaches use both positive rebuilding and preventive, or stress-reducing techniques.

Building positive strength involves a series of stages or steps which we need to clarify before we talk concretely about child-rearing patterns in the culture—steps partly formulated by Erikson in *Childhood and Society:*[6]

1. Finding that life is good and that needs can be met: *trust.*
2. Finding that you can meet them yourself: *autonomy, initiative,* and *industry.*
3. Finding that you can work with others toward meeting group needs: *cooperation.*
4. Finding that threats and danger can be handled, through *avoidance* or *mastery.*

CULTURAL INFLUENCES

We must look at cultural and child-rearing patterns as they affect the needs of the child at each age-level—infancy, preschool, school-age, adolescence—and his ability progressively to tolerate and cope with stress. A balanced approach also involves thinking about "emotional needs" and "ego development," and their integration both as positive interests and areas of satisfaction, and as methods of control and defense. In our thinking, then, about child-rearing patterns and the impacts of the culture on them we will want to keep in mind these questions: What does this pattern or group of patterns mean to the child emotionally? What do they mean to the development of his skill in handling the environment? What do they mean for his image of himself and of the world in which he lives?

Among the many obvious aspects of the culture affecting children in the United States are:

1. The small family with its individualistic and competitive, but cooperative, values; its areas of spontaneity and rigidity; its mobility; its reliance on babysitters; its excitement about, but often sense of being burdened by, the babies;
2. Medical guidance, which dominates hygiene, feeding-elimination-sleep routines, inoculations, vitamins, separation of mother from the child immediately after birth and during hospitalization;
3. Property with its competitive values and its stimulus to interference with the freedom of the child; its comforts, play resources, creative stimulus;
4. The culturally heterogeneous and conflictful life of many communities—religiously, morally, sexually, aggressively, and structurally—in relationships between classes and shifts from one class to another;
5. Educational ambition which includes the requirement to meet standards of performance in every area, as well as to develop an understanding of oneself and the world one lives in;
6. Measurement consciousness, with its stimulus to growth and also to standardization of the child by pressure to conform to norms which generally ignore or minimize the wide range of individual differences in normal samples;

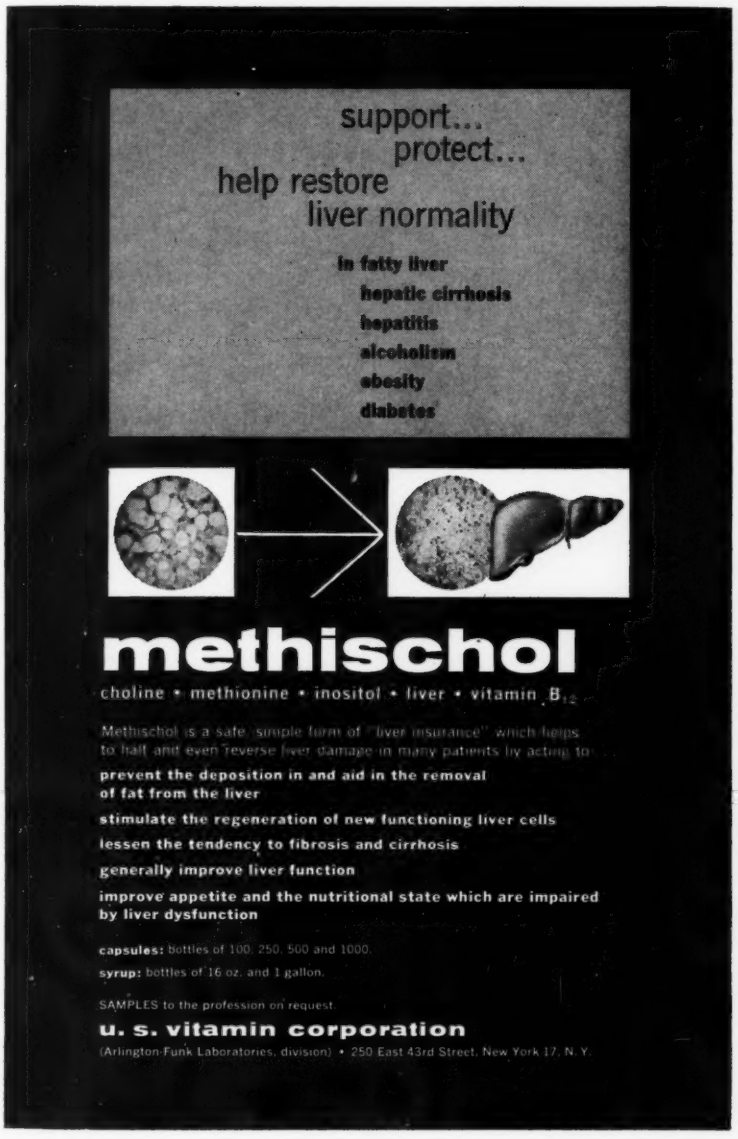
7. Confusion regarding discipline, values, and demands made on the child;

8. Mobility: the frequency of moving which can increase confusion in values, make it hard for the child to sink in roots and develop a sense of stable harmony between his inner self and a familiar world outside; which at the same time may acquaint the child with a wider range of people and communities, and lead to broader awareness of ways of life;

9. Distorted or deprived parent-child relations growing out of the deprivations of the previous generation, in which the cumulative effects of two world wars are exacting an increasing toll; parents' compensatory efforts to create happy experiences;

10. The increasing dominance of irreality and secondhand experience as TV, added to movies and radio, becomes an easy pacifier for children from the age of 2 on, along with the increased information that TV brings to children.

These influences do not come one by one but are fused in the experience of the baby who is greeted with enthusiasm and cared for thoughtfully. A typical middle-class suburban or metropolitan child is born in a hospital, fed from a bottle and often with a bottleholder as soon as he is steady enough to get his milk that way. He is brought up in a buggy, crib, high chair, playpen, and other furniture. He may be toilet trained early or late, but the chances are that his mother hates diapers. Babysitters substitute for mother when she goes shopping. Muscles and large-muscle activity are encouraged from his earliest months by both his parents, who get excited as he learns to sit up, stand, walk, and climb. Yet as he begins to get into, onto, and under furniture and to grab it, he is generally interrupted, scolded, or slapped for the exercise of the very functions his parents stimulated. Father's professional training may make him quite preoccupied in getting his M.D. or Ph.D., or getting "ahead," and leave him with little chance to play. Probably our typical child's mother doesn't sing him any lullaby, but he does see television early. If his father is in the Army or Navy or is with a big corporation that manufactures and sells on a national scale, his family may move from one place to another too frequently for him to establish roots anywhere.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STRESS PRODUCING FACTORS

These things all sound familiar enough and certainly in and of themselves are not likely to create pathology. We all know plenty of children who get along all right in exactly this kind of life, especially when parents feel comfortable with their own design for living and can give the growing child the support he needs at crisis points or transition points. When does trouble arise? What do these things have to do with hyperactivity, nervous habits, autism, psychogenic retardation, phobias, uncontrollable aggression and other problems brought to our clinics?

We are far from having the necessary data for dealing with such troubles empirically. As professional people we have tended to focus on a few central areas: feeding and toilet-training experiences; discipline; separation from mother; frustrations in the mother-child relation as a whole. But many other factors are involved, most of which have not been studied fully.

We agree that mental health suffers from:

1. *Vulnerability:* exposure to excessive stress;

2. *Emotional deprivation,* traceable to one or more of several sources, and including lack of adequate range of *gratification;*

3. *Anxiety,* also traceable to any combination of a multitude of sources;

4. *Conflict:* lack of integration; and

5. *Lack of adequate defense* against, and compensation for, stress and deprivation.

When factors such as those just mentioned produce anxiety, conflict, or insufficient gratification, particularly in a child who is at a sensitive stage of development or who is naturally vulnerable, we have trouble. The same combination of conditions can be disturbing to one child but not disruptive to another.

Vulnerability in the child may arise from unusual sensitivities, uneven growth patterns, specific damage—as a brain damage, illness, or other cause. Vulnerable children make mothers anxious, and this anxiety contagiously makes the children more anxious, lowering their thresholds for response to stress. Children with more than usual sensitivity to sounds or

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sights or to sensory stimuli in all modalities are more exposed to all the minor and major impacts of the environment.

In our culture, the sensitivity of parents to the normal, or rather to the optional and ideal, often makes them tense, or even guilty, at any deviations or failures to reach the ideal. Thus, in a norm-sensitive culture, vulnerability easily creates a cycle of mutually reinforcing anxiety. Such parents need help in developing more tolerance for deviations from the ideal all along the line.

With babies who have severe colic, diarrhea, and other physiological misery in their first 3 to 6 months there is, in addition to the anxiety of the mother, her fatigue, even exhaustion, which in our small-family culture means that the baby is cared for by a mother who hasn't the strength constantly to give such a baby the extra supply he needs to help the process of establishing inner stability.

Emotional deprivation both makes a baby vulnerable, and, as in the types of depressed and anaclitic reactions described by René Spitz, interferes with basic growth drive. This emotional deprivation occurs also in a cultural setting where a mother may have to go to a hospital for a period of time and can leave no familiar mother-substitute with her baby.

Mechanical feeding devices, mechanical nursemaids, like playpens, the cultural pattern of isolating the baby from birth, all can contribute to emotional deprivation when they are used to excess or without awareness of what the experience means to the baby. We know from animal studies that deprivation of sensory experience interferes with the development of intelligence, and observations of young children give plenty of evidence that they use sensory or other basic gratifications to offset frustrations and disturbed feelings. Isolating devices, like playpens, can in effect reduce needed sensory gratification and comfort.

Cultural factors which interfere with a rich infantile sensory experience can be expected to leave the child without reserves in his mental-health bank to balance up the withdrawals by deprivation and trauma. Such factors include all the conditions in middle-class life which oversanitize, overorganize, overstructure the life of the young child so that he is unable to obtain the natural primitive gratifications which build this balance in the emotional bank—from mud pies to war whoops.

Anxiety may be generated by many factors. Some major ones are these:

— irregularities in the child's growth pattern, such as in children who are verbally advanced but slow in motor development, or the reverse, in a subculture which emphasizes the importance of meeting standards or normality in a family that expects the child to meet high standards in every area.

— difficulties in coordination which produce frustrations to the child attempting to master his environment;

— blocks, interruptions, and frustrations in exercising autonomy at the age when he has his autonomy spurt; interferences which are an everyday matter in the city where middle-class children are often harnessed, held by the hand, and hovered over until kindergarten age or later;

— traumata from operations, accidents, and such, particularly when these occur before the age of 3, and in quick sequence, or at a time when the child is making other difficult adjustments;

— autonomic instability, aggravated by overstimulation, illness, or emotional stress;

— physiological pressures, due to problems in feeding, tense toilet training, skin or temperature sensitivities, and such;

— inadequacy in coping with physical threats from peers or adults, due to low muscle tonus, small size in relation to the rest of the family;

— sudden disturbances in established relationships, due to illness in a parent, conflict between parents, or long absences.

All of these factors need to be seen from a cultural or child-rearing point of view in relation both to adult attitudes and handling of the child, and to the concrete experience of the child in the environment.

Normative pressures in our culture add to the anxiety around growth irregularities ("my 15-month-old boy is walking but he isn't talking yet"). Property emphases in our culture that lead to constant protection of things from the child ("nothing is safe in our house") involve frequent interruptions of the child's drive to be active and explore which creates

anger between mother and child. Cultural patterns of doing things *to* the child (inoculations, operations, and other body violations) at an age when the child is old enough to suffer and remember but not old enough to understand or master the threat also cause anxiety in children, especially those under 4 or 5. Cultural anxiety about nutrition, quantity of food intake ("why doesn't he finish that bottle?"), and about elimination ("he didn't have a bowel movement today") contributes to physiological tension and uneasiness about eating and related basic functions. At a later age, grossly contrasting patterns of approval and disapproval in different social classes can create anxious conflicts: to fight, in the lower-class groups studied by Havighurst and Davis[7] or not to fight, in middle-class groups.

In the heterogeneous culture of large cities, it is the rule rather than the exception for the child to be exposed to widely differing values and standards in the home and neighborhood. "What mother forbids, the mother next door permits," and vice versa, "Grown-ups don't do what they preach. Public leaders tolerate gangsters or connive with them." "Families expect one standard; schools expect a different one; schools try to adapt learning demands to the child's growth rate, while parents want the child to learn to read at 6," or vice versa. Many strands of influence are tying each other into knots with the child in the middle.

Conflict and lack of integration also arise from deeper sources. With the high divorce rate and the prevalence of home tension, from early months the child may have conflicting identifications; that is, conflicts in identifying with two people who can't achieve integration in their mutual life. Oedipal conflicts and sibling rivalries are often increased by the intensity of emotional relationships in a small family, made smaller by the mobility of American life which separates children from potentially comforting grandparents.

For comparison, we might look at a village child in India whose mother has an easy experience at childbirth, nurses her baby until he is 2 or more and old enough to lose interest in nursing because of the competition of other activities, carries him with her wherever she goes so that he does not know what separation is. Her child is carried by an older sibling when a new baby takes over his mother's arms. He receives no toilet training until he is old enough to get around on his own feet and learns where to go. When he begins to run around for himself, he has the freedom of the house and the village with nothing to daunt or disturb his budding autonomy since there is nothing breakable or damageable. With many of these children no severe separation, isolation, or deprivation is experienced.

We can see that we have here a rich complex of factors among which the specific feeding and toilet-training experiences are only two, however fundamental they are, because of the opportunity for massive emotional reactions and conditionings in these settings.

Defenses against stress and deprivation have already been mentioned in relation to emotional deprivation, but more is needed here. Everything in the subculture, including the neighborhood as well as the family, which builds confidence, pride, skills in mastery, security in problem solving, flexibility, and perspective on emotional disturbance—including such expectations as are implied in cliches like "every cloud has a silver lining" or "tomorrow will be another day" (as contrasted with "it never rains but it pours")—is part of the total child-rearing experience and contributes to the child's equipment to deal with the stresses of his life.[8]

With the opportunities provided by the subculture for the optimal development of the resources of the individual, we can also include intelligence. Children in slum areas, bad schools, deprived neighborhoods, may or may not be deprived of the emotional nourishment they need, but they are likely to be deprived of the experience of seeing how people cope with problems. They may thus be left more helpless than middle-class children who can observe and participate in a wider range of learning experiences that are useful in coping with emotional and environmental problems. The more our schools can provide genuine experiences in real-life situations, the more confidence children can develop in their ability to handle problems.

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*Stewart, B. L., and Rowe, H. J.: J. Am. M. Ass. **160**:1221, 1956.

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Dr. D. R. MacCalman reporting on British children, and Rhoda Metraux reporting on German child-rearing patterns[9] have, in different ways, emphasized the importance of learning to cope with frustration or life's problems as such—an approach quite distinct from that of measuring up to norms for "successful performance" in all areas. Learning to stand up for oneself, to think for oneself, to find solutions of one's own, are very important ingredients of coping.

Roger Barker's research[10] on a small rural town in the middle west, where delinquency is unknown and children are by and large relaxed and healthy, records a comfortable tempo, much time for exploring and mastering one's environment, much companionship between adults and children, and warm support and encouragement when a child fails in some effort like learning to fly-cast.

STRENGTH BUILDING FACTORS

Mental health develops when most of the following are present:

(a) *Good start physiologically*—freedom from gastrointestinal discomfort, frustrating defects in coordination, perception, integration;

(b) *Emotional nourishment;*

(c) *Adequacy of sensory stimuli;*

(d) *Opportunity for motor development* and freedom from excessive pressure for performance;

(e) *Range of experience;*

(f) *Stable relations with mother* during the period of establishing clear concepts of self and other persons.

(g) *Stable, respected interests, possessions* (cathexis);

(h) *Opportunity to exercise autonomy,* initiative, industry, to achieve mastery over various areas of the environment;

(i) *Feeling supported,* accepted, a source of pride and satisfaction to parents;

(j) *Opportunity to cope* with gradual doses of frustration and difficulty;

(k) *Participation in group life* with some recognizably consistent pattern (freedom from demoralizing conflicts).

TO SUMMARIZE

The complexity, conflict of values, pressure to perform, and emphasis on protection of property make it impossible to give any simple answers to the question of what is the effect of child-rearing patterns on mental health today. Mental health for a lifetime cannot be guaranteed by self-demand feeding in the first year of life, nor does mental breakdown inevitably occur as a result of early toilet training. Children who are shy at the age of 4 are not necessarily on the way to schizophrenia. It becomes more and more clear that mental health and mental disturbance are the resultants of a complex and varied group of influences from within and without the individual child, and that the part of wisdom is to become increasingly aware of what this total interplay actually is in the case of individual children. This means thinking of the equipment of the individual child and what his resources are for coping with the pressures of his situation, as well as thinking of what those pressures are as he experiences them. One child thrives on a routine which cramps the style of the next. One child goes haywire with a degree of freedom which another child uses creatively.

This brings us to the concluding question: What child-rearing help does each individual child need in order to build more strength to handle the problems he finds in his own subculture situation?

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Safeguarding children from radiation risks*

Robert W. Miller, M.D.†

On June 12, 1956, there appeared the first of a series of publications issued by six committees of United States scientists called together by the National Academy of Sciences—National Research Council to review comprehensively the biologic effects of nuclear and allied radiation.[1] Simultaneously the British Medical Research Council presented to Parliament its report on the same subject.[2]

These scientific groups were composed of individuals who are among the most learned in their countries in the various fields of medicine and in the basic sciences as they relate to radiation[3] effects. They evaluated the mass of scientific information on radiation effects in man and the sources of radiation exposure. The results of their deliberations are available to anyone who desires copies.

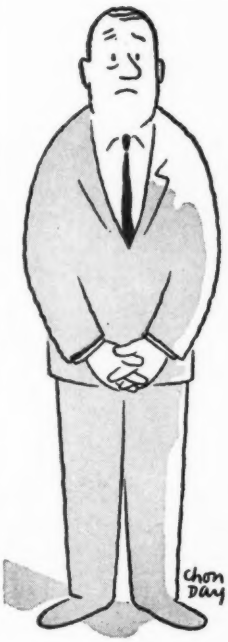
The British panel for the review of genetic effects was made up of 7 scientists and the American group of 18, 16 committee members and 2 consultants. For the study of the effects of radiation on the health of the individual, the British panel was composed of eight scientists. In this country the corresponding Committee and Subcommittee on Pathologic Effects of Atomic Radiation had 49 members and 8 consultants. The American report also contains the findings of other committees concerned with estimating present and possible future contamination of air, sea, and land with radioactive materials from atomic industry and weapon testing.

Both the American and the British reports concluded that the genetic effects are the determining factor in establishing man's allowance for wholebody radiation. They pointed out that information derived from experimentation on fruitflies and mice indicates that mutant genes, unlike other radiation-induced damage, are produced by even the smallest exposure of the reproductive cells to radiation. While little is known directly about the effects of radiation on human genes, the patterns of genetics are generally thought to be the same for all forms of life which reproduce sexually. In all but the very rarest instance, radiation-induced mutations are detrimental, according to the reports. In the next generation, or in generations farther in the future, they may cause or contribute to the occurrence of miscarriages, congenital malformations, or, more subtly, increased susceptibility to certain diseases.

Radiation-induced genetic mutations are of concern only when they take place in the gonads of individuals who are in the childbearing age or younger. The reports' recommendations for minimizing radiation exposure in medicine and dentistry apply, then, most particularly to those responsible for the medical and dental care of children and young adults.

The United States and British scientists both concluded from their reviews of current genetic theory that *for the population as a whole* the average accumulated dose of radiation *to the gonads* should not exceed 10 roentgens from conception to the age of 30 years. About

*Reprinted from *Children*, November-December 1956.
†Dr. Miller is Professional Associate, Committee on Atomic Casualties, National Academy of Sciences—National Research Council.



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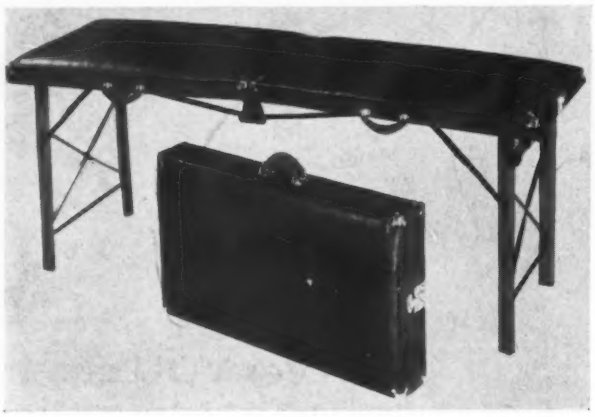

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half of the children in the United States are born to parents under 30, nine-tenths to parents under 40. This allowance is for radiation exposures in excess of that from the natural environment to which man has always been exposed.

Both scientific groups recommend that *for the individual* the dose of radiation accumulated by the reproductive cells in the first 30 years of life should not exceed 50 roentgens. The British scientists add that not more than one individual in 50 should receive this maximal permissible dose.

These figures are based on today's best estimate of the impact that a 20-percent nationwide increase in the number of mutant genes would have on the health and development of the descendants of today's population in the United States.

Radiation produced X-rays and fluoroscopic diagnostic practices in medicine and dentistry is the greatest *present* threat to our population's allowance for safety, according to these reports. They point out that while little is known of the delayed fallout of radioactive particles that are stored in the stratosphere as a result of testing large nuclear devices, the dose received from *external* radiation of fallout from nuclear test weapons *at the present rate of exposure* is negligible. Medical and dental X-ray procedures in the United States now exhaust from 3 to 4 of the 10-roentgen limit, as defined above. Again the reader is reminded that these figures are averages for the dose acquired by the reproductive cells of the population as a whole.

That the most ordinary diagnostic medical and dental X-ray exposures can be additive throughout the life of the patient is a relatively remote concept to most practitioners of medicine. In this age when machines and substances that emit radiation are used more and more commonly in medicine, in industry, and by the military, it is urgent that man's tolerance be dissipated as little as possible, and from the very start of life. Who can tell which of today's babies will, 25 years from now, be exposed frequently to X-ray machines when, in adulthood, they work as doctors, dentists, nurses, technicians, or attendants? Which of these babies will later be the factory workers inspecting golf balls with the use of fluoroscopes, or the men who mine uranium, or the people working near nuclear power generators?

For the individual, how much of the scientists' recommended maximum permissible dose of 50 roentgens, accumulated by the gonads in the first 3 decades of life, is spent as the patient undergoes various radiologic tests?

Very little of the radiation that is directed to the individual's chest, head, arms, or lower legs reaches his reproductive cells. Some, however, does reach the gonads by the scatter that occurs when the radiation is deflected by bone or by structures near the patient. Reproductive cells may be directly under the beam of the X-ray when radiologic studies are made of the hips, spine, pelvis, or abdomen.

When one X-ray film is made of the abdomen, the dose to the skin of the patient at the point where the radiation enters his body is about 1.2 roentgens, varying with the technical X-ray factors used. If the testes are included in the radiation field, they may receive virtually the full skin dose. As the radiation passes through the tissues some of it is absorbed, so that deeper organs receive a smaller dose. Because the ovaries are partially shielded in this manner, they are subjected to perhaps one-sixth of the skin dose. Some radiologic studies, such as the intravenous pyelogram, require a series of X-ray films of the pelvic region.

The expenditure of one's allowance for radiation is greater when fluoroscopy is used than when an X-ray film is made. In fluoroscopy, the patient's skin facing the beam of X-rays may receive between 2 and 100 roentgens per minute, depending on the output of the machine used and the distance of the patient from the source of radiation. The usual dose, however, is 10 to 20 roentgens per minute. The area under examination is customarily exposed for 2 to 5 minutes. The testes are not likely to be included in the fluoroscopic field except when abdominal studies are performed on infants and small children, but in all fluoroscopic procedures the reproductive cells receive some scatter radiation.

In the past when X-rays or fluoroscopic studies have been made of the abdominal or pelvic region or of the hip it has not been common practice to protect the testes by placing a layer of lead between

this organ and the radiation. This usually would not alter the diagnostic value of the roentgen procedure. Yet even in some of the best hospitals in the United States today, the value of this simple protective measure is not recognized. Methods are being investigated for shielding ovaries without obstructing the view of the organs under study.

Because many physicians have seen no clinically detectable ill effects in their patients, the concern that geneticists have expressed has seemed to many practitioners in the past to be of small consequence. The present reports may improve the understanding, and consequently the practice.

What are some of the precautions that should be taken in the future?

The observations that follow are the present author's interpretations, drawn from the radiation literature[4,5] and from clinical experience,[6] of the implications of the British and United States reports.

When radiation is administered by a well-trained person, there is no acute hazard to the patient.

X-ray films should be obtained, of course, whenever it is a matter of medical necessity, but under all circumstances the patient should receive the smallest exposure that will provide adequate diagnostic information. There should certainly be no limitation of the use of properly administered roentgenologic procedures for the early detection of diseases that would otherwise elude recognition. Thus, survey films for the identification of early tuberculosis, cancer, and other diseases commonly detected by X-ray in properly selected groups are not to be discouraged.

When a radiologic examination is needed, an X-ray film should usually be obtained initially. After the survey film has been secured, a fluoroscopic examination can be made, if it is required, to obtain more information about the abnormality. This would preclude the use of fluoroscopy routinely as part of the monthly examination of the infant in the first year of life, a rather common practice in certain parts of the United States.[7]

In clinical practice, as distinguished from clinical investigation, X-ray is sometimes used for the prevention or treatment of disease without adequate scientific proof that it is beneficial. For example, an occasional physician has subjected all newborn infants coming into his practice to prophylactic radiation of their thymus glands in the belief that this increases the child's resistance to infection. There has been no well-designed clinical study to substantiate this belief. Studies have been made which suggest that children whose "enlarged" thymuses are treated by radiation early in life have an increased incidence of cancer of the thyroid and of leukemia in the next 2 decades.[8]

Irradiation of the ovaries for the relief of sterility in women, which usually involves a dosage of 50 to 90 roentgens, has been widely practiced by several gynecologists and enthusiastically recommended to the medical profession by them.[9,10] They have apparently not contrasted the results they obtained in the radiation-treated women with those in a sham-treated comparable group observed concurrently in a "double-blind" study: that is, one in which neither the attending physician nor the patient knows which procedure is used. It may be that the preparation for the X-ray treatment evokes an emotional response in the patient that makes pregnancy possible. If this is the case, an equally effective device may be found to produce the same results without administering radiation and so spare the descendants of these women an extra load of mutations.

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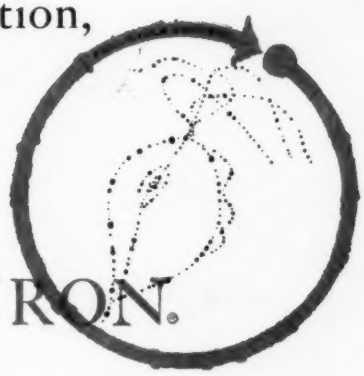

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References: 1. Bernstine, J. B., and Rakoff, A. E.: Vaginal Infections, Infestations and Discharges, New York, The Blakiston Company, Inc., 1953, p. 235. 2. Overstreet, E. W.: Arizona M. 10:383, 1953. 3. Schwartz, J.: Obst. Gyn., N.Y. 7:312, 1956. 4. Crossen, R. J.: Diseases of Women, St. Louis, The C. V. Mosby Company, 1953, p. 292.

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NONGENETIC EFFECTS

The nongenetic effects described in the following paragraphs are from the American and British reports. Descriptions of the mechanisms by which these changes may be produced are from the reviews of the literature.[5,6]

Most of the disabilities caused by radiation-induced mutations will not make their appearance until several generations after exposure, and so are not likely to be a matter of real concern to most people. Of more immediate interest, perhaps, is the threat to the health of our own generation from excessive exposure to radiation. To determine what immediate or delayed effects there may be to the living and to their immediate offspring, one must examine information derived from animal experimentation, from the accidental overexposure of human beings, and from the survivors of the atomic

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The sum of these experiences indicates that *nongenetic* radiation-induced disease does not become clinically apparent until a threshold has been exceeded. Lesser exposures fall within the range of tolerance and the subject experiences no noticeable ill effect. If the radiation dose is not a lethal one, the nongenetic damage to the body is usually repaired within a few weeks of its occurrence, but this recovery may be incomplete. Some malfunctioning cells may apparently lie dormant for years. Then, when some other change in the patient's body or environment occurs, the malfunction worsens or the number of defective cells increases until finally a clinically recognizable disease develops. Since the injury sustained by a series of exposures may be cumulative throughout life, each repetition of injury may hasten the approach of the threshold for late effects.

Animal experimentation has shown that at certain times in pregnancy some of the organs of the embryo are especially susceptible to the effects of radiation.[11] This has been confirmed in the human being. In Hiroshima and Nagasaki, women who were heavily exposed to the bomb when they were between the 7th and 15th weeks of pregnancy gave birth to children who suffered mental retardation associated with a smaller head circumference than normal.[6]

Children are thought to be more susceptible than adults to the delayed effects of radiation because rapidly dividing cells are generally more susceptible to such damage produced by this physical agent. In addition, because of their longer life span, children are more likely than adults to survive the latent period of the delayed sequelae.

The study of the atomic bomb survivors in Japan shows conclusively that the incidence of leukemia in man increases as the result of single large exposures of the whole body to radiation. It has been reported that the incidence of this disease among radiologists in the United States is nine times greater than among physicians who are not radiologists.[12] If further studies substantiate this, it would mean that very small daily radiation exposures *of the whole body* can also produce this disease in the human being. The medical literature contains accounts of an increased incidence of leukemia among children given radiation therapy for enlargement of the thymus gland,[8] and among adults who have received irradiation of the spine for rheumatism.[2] If these are confirmed by additional studies, one would conclude that *partial* body exposures to therapeutic doses of X-rays can also induce leukemia.

Premature aging is a late sequel of radiation which has been found in laboratory animals but has not yet been conclusively demonstrated in man. The shortening of life that occurs is proportional to the dose of radiation given. The animals grow senile when they are only middle-aged, and their deaths are caused by the multiplicity of diseases that ordinarily beset the elderly members of their species.[13]

While these observations suggest that the human population as a whole may have a liberal margin of safety for delayed effects of radiation other than genetic mutations, the minimal dose level for producing these changes in any individual is unknown. It probably depends on his natural resistance to radiation and on the influences of other changes in his environment—diseases, drugs, aging, more radiation. Conceivably a combination of factors could cause an occasional individual to be unusually susceptible to the effect of radiation.

While it is extremely unlikely that medical or dental diagnostic X-rays, when properly administered, will precipitate any of the nongenetic late effects, cumulatively they may shrink a patient's tolerance so that he will be less well able to withstand an unavoidable exposure to radiation in the future.

CURRENT RADIATION PROTECTION

There are physicians, particularly radiologists, who endeavor to protect their patients and personnel from the possible late effects of X-rays. They have devised radiologic techniques that lessen the area of the body that must be exposed, the time that the patient is subjected to the X-ray beam, and the dosage output of roentgen-ray machines. However, the operation of many X-ray devices is not under the supervision of individuals properly trained in radiologic procedures. It is in these instances that unnecessary exposures are most likely to occur. The recommendations of the Committee on Radiation Protection, of the American

College of Radiology, may not reach a large portion of individuals using X-ray equipment.

The gains that can be made to diminish unnecessary radiation exposure are exemplified by the history of fitting children's shoes through the use of fluoroscopy. Physicians pointed out that shoes could be equally well selected without the use of this procedure, in which the output of the machines was often needlessly high, shielding was inadequate, and exposures were prolonged or repeated because of the interest of the children. In some States laws have been passed which bar or limit the use of fluoroscopes for this purpose. Five years ago they could be seen in many shoe stores. Now they are disappearing.

A CHALLENGE TO HEALTH WORKERS

It has been recommended by the aforementioned British and American scientific groups that roentgen-exposure diaries be kept for each person. This would enable the physician in the community, in the armed forces, and in industry to be conscious of the accumulation of X-rays already absorbed by the patient. It is recommended that to conserve one's tolerance to radiation as much as possible, doctors and dentists use X-rays only when it is "consistent with medical necessity" to do so, and then to use the least dose that will give satisfactory results. Although as leading physicians declare, keeping an exact account of the dosage received by every individual may be impractical, perhaps a list of each patient's roentgen-ray exposures would help his own physician to be aware of the record to date.

To achieve a reduction in radiation exposure, it will be necessary to impress physicians and dentists with the need for doing so. The writings of individuals on this subject do not carry the balance and authority possessed by the groups of British and United States scientists mentioned earlier in this paper. With the publication of the findings of these expert committees, an opportunity has been given to the medical and dental professions to implement the recommendations made. Scientific groups must now decide the extent to which the known facts should govern radiologic procedures as they are employed by each of the medical specialties and in dentistry. This applies both to the mechanics of using radiation devices and to the purpose for which they should be used. Scientists must advise on measures to be taken to familiarize students in professional schools and practitioners with this information. They must identify the gaps that exist in the understanding of radiation effects and provide the stimulus for undertaking laboratory and clinical investigations that will dispel the uncertainty and increase our knowledge.

On the subject of late radiation effects, the most authoritative scientific organizations in both the United States and Great Britain have set the stage and raised the curtain. The remainder of the performance is the responsibility of all professional health workers, particularly those concerned with children.

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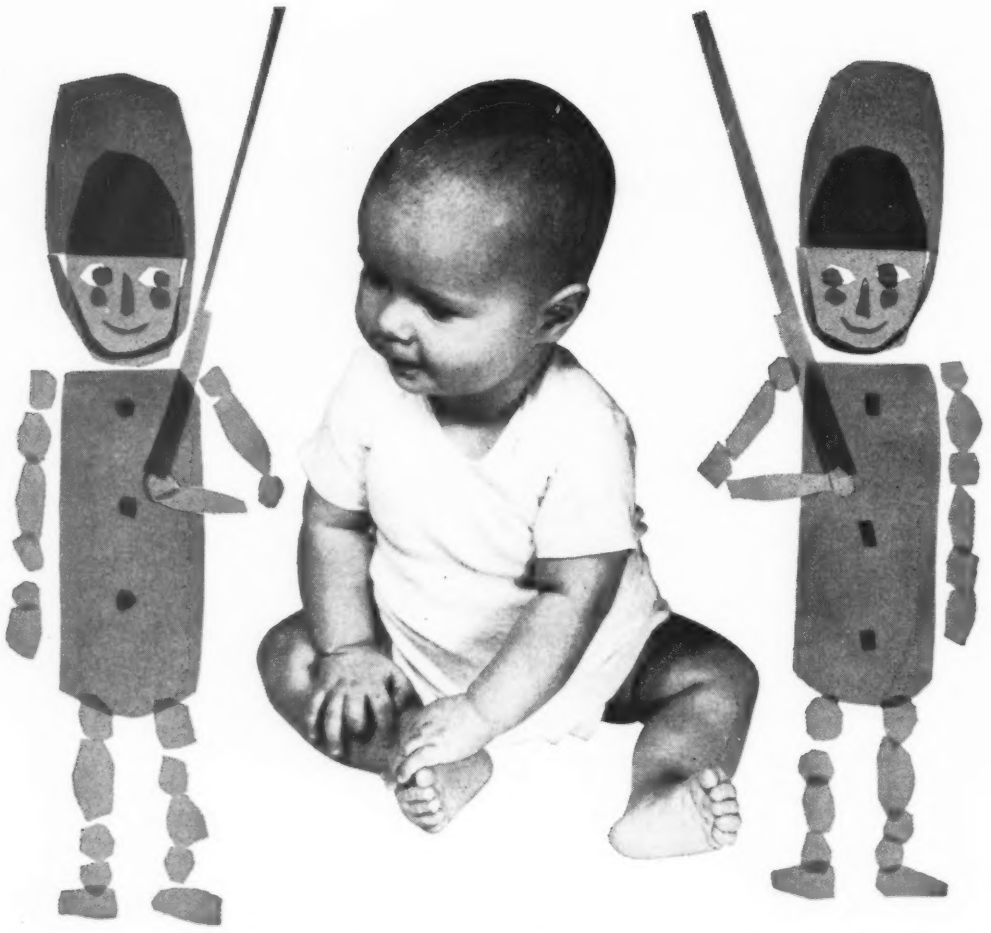

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Report on barbiturates*

(Continued from January JOURNAL*)*

PREVIOUS RECOMMENDATIONS

In 1943 in the belief that barbiturates were being sold indiscriminately, the commissioner and deputy commissioner of health of New York City requested the Committee on Public Health to consider the subject and to recommend a solution. At that time the Sanitary Code of New York City included barbiturates among the harmful drugs which could not be dispensed without a written prescription. It further provided that any prescription containing barbiturates should not be renewed or refilled by a pharmacist if it bore any indication to that effect.

The health department was of the opinion that in the indiscriminate use of barbiturates the supply was from two sources: (1) over-the-counter sale by pharmacists; (2) refilling of prescriptions by pharmacists. As a possible control of the second source the deputy commissioner suggested an alternative: (1) to prohibit the refilling of all prescriptions containing barbiturates, a procedure that admittedly might be highly unpopular; or (2) to undertake an educational campaign among physicians to make more frequent use of their prerogative to limit prescriptions to a single filling. The opinion of the Committee on Public Health was sought concerning the desirability of these proposals.

The committee stated its belief that it was inadvisable to prohibit the refilling of all prescriptions containing barbiturates since such a policy would work an undue hardship on those patients who might be required to use barbiturates continuously; for example, epileptics. As for the alternative course of action, the committee doubted whether physicians should be asked to antagonize patients by writing "nonrefillable" on prescriptions inasmuch as the physicians' motives would certainly be misconstrued.

The committee recognized two other methods by which the sale of barbiturates might be further controlled: (1) the Sanitary Code might be revised to provide that prescriptions for barbiturates should not be refillable unless the physician indicated otherwise; and (2) prescriptions for barbiturates might carry an expiration date of 6 months or perhaps a year. Exceptions might be made for prescriptions in which the barbiturate was not the main ingredient.

After consideration of all the aspects, the committee reached the conclusion that the use of barbiturates did not then constitute a sufficient problem in public health to warrant the adoption of any measures for restriction beyond those then in the Sanitary Code. It was believed that the production of barbiturates was not unduly large in view of the number of epileptics. Moreover, the committee reasoned, further control of the sale of barbiturates would not materially reduce the number of suicides, since a person bent on self-destruction by barbiturates could go from physician to physician in order to obtain a sufficient quantity or could resort to other methods of suicide. The committee summarized its position: "In view of the fact that the barbiturates do not present a large public health problem from the point of view of suicides, toxic psychoses, addiction, or chronic poisoning, and since the suggestion for the further control of their sale by the department of health would either work a hardship on those who must use these drugs almost con-

*Reprinted from *Public Health Reports*, November 1956.

In view of the national interest in commerce in barbiturates, Public Health Reports reprinted from the June 1956 *Bulletin of The New York Academy of Medicine* the report of its Committee on Public Health. The report was prepared by the Subcommittee on Barbiturates: Haven Emerson, M.D., chairman, Henry Aranow, Jr., M.D., George Baehr, M.D., McKeen Cattel, M.D., Hubert S. Howe, M.D., Lawrence C. Kolb, M.D., Robert W. Laidlaw, M.D., J. Murray Steele, M.D., H. D. Kruse, M.D., secretary. It was approved by Edward J. Donovan, M.D., president of the academy.

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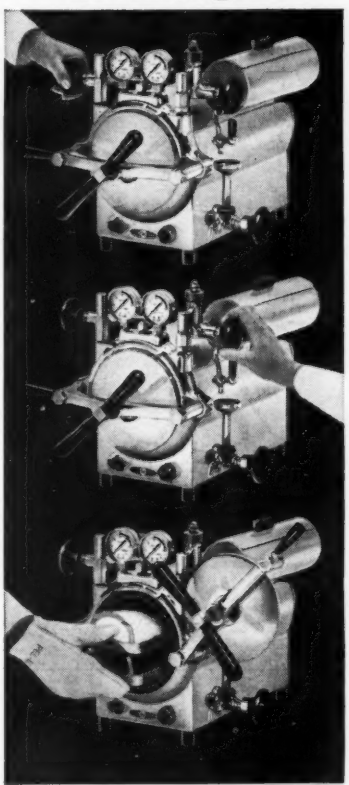

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tinuously, or would place physicians in an unnecessarily difficult position, or would prove unenforceable, the committee is of the opinion that no revision in the Sanitary Code should be recommended at the present time."

Because of the reported growth of illicit trade in barbiturates and the increase in accidental poisonings and suicides by them, the Committee on Public Health in 1945 at the request of the commissioner of health of New York City again considered the desirabiliy of extending restrictive measures regarding their sale and distribution. The commissioner submitted to the committee a draft of proposed regulations which had been formulated in cooperation with the New York office of the Federal Bureau of Narcotics.

After studying the problem and the suggested proposals, the committee came to the conclusion that stricter measures of control over the sale and distribution of barbiturates were warranted. The suggested extension of control, however, was not to operate to interfere with the freedom of physicians in their practice; rather, it was aimed to guard against misuse of barbiturates by the dispenser and the user.

The committee recommended the following specific regulations:

1. Prescriptions should be refillable when so indicated by the issuing physician; but such prescriptions should indicate a minimum interval between renewals and the total number of renewals. No prescription containing a barbiturate should be refillable after 6 months from the date of issuance.

2. Pharmacists should not reveal the content or furnish copies of prescriptions to patients.

3. Prescriptions should carry suitable information about the identity of the patient and the prescriber.

4. In an emergency a physician should be allowed to transmit to a pharmacist by telephone a prescription for not more than six average doses of barbiturate drugs provided a written prescription is supplied to the dispensing pharmacist within 72 hours. Should the pharmacist fail to receive such a written confirmation, he should notify the health department of the omission.

5. Proper records of dispensed barbiturates should be kept by physicians, dentists, and veterinarians.

6. Manufacturers, wholesalers, and jobbers should maintain suitable records of sales and distribution, and inventories of stocks.

7. Pharmacists should keep records of bills of purchase of barbiturates and copies of prescriptions on which such drugs were dispensed, including notation of amounts dispensed upon refilling.

8. Barbiturates should not be supplied to any person except on prescription or in the course of legal sale within the drug trade.

All of these recommendations in either their original or a slightly varied form were incorporated into the Sanitary Code by the end of 1947. They are presently in force.

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LEGISLATION

New York City

Prior to October 11, 1922, the Sanitary Code contained no specific provision concerning the sale of barbiturates. They were regulated by the provisions applicable to all other drugs. These regulations included:

1. Registration with the New York City Department of Health of non-prescriptive proprietary and patent medicines;

2. Provisions against misbranding, imitation, and substitution; against false and misleading statements; and against failure to disclose alcohol, narcotics, chloroform, chloral hydrate, and acetanilid;

3. Prohibition against dispensing a prescription, decoction, and medication under false or miselading names, direction, or pretense.

In 1922 the board of health adopted section 126 of the Sanitary Code which was entitled "Veronal, etc. sale regulated." This section forbade the sale at retail, except upon written prescription, of veronal, veronal sodium, luminal, and luminal sodium, together with sulphonal, tuinal, and tetranol. Additionally, these substances were designated by chemical name, and provision was made that the section apply to these drugs by whatever name called or known.

In 1940 the Sanitary Code was amended by section 116 on prohibition of manufacture and sale of adulterated and misbranded drugs which incorporated the

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provisions of section 502 of the Federal Food, Drug and Cosmetic Act of 1938. This section applied to all drugs.

In the same year the Sanitary Code was further amended by section 118 which regulated more fully the sale of barbiturates in New York City. Barbiturates were included among the drugs which could not be dispensed without a written prescription, and this prescription could not be refilled if it bore an indication to that effect.

The 1945 recommendations of the Committee on Public Health were for the most part adopted by the board of health in 1947 as amendments section 118 b, c, d, and e to the Sanitary Code. Differences from the recommendations were: The life of the original prescription was reduced to 3 months. The recommendation requiring physicians to keep records of barbiturates dispensed was not adopted. Instead, labeling of the container by the physician dispensing barbiturates was specified. The provision allowing for filling of a telephone prescription for barbiturates did not appear in the amendments of 1947 but was adopted in 1948.

New York State

There was no specific legislation on barbiturates or other hypnotic or somnifacient drugs prior to 1939. In that year the Education Law was amended by addition of section 1360a entitled "Hypnotic and Somnifacient Drugs" which by definition included barbiturates. The basic requirement was a written prescription. Later in 1939, article 51 regulating the practice of pharmacy was completely revised to incorporate the provisions of the Federal Food, Drug and Cosmetic Act of 1938 with respect to drugs and cosmetics. During this revision section 1360a was repealed. No specific legislation on barbiturates was again introduced into the Education Law until 1945.

In 1945 a new section 1366a, entitled "Hypnotic and Somnifacient Drugs" was introduced into the Education Law. By definition this section again included barbiturates and in the main duplicated section 1360a of the 1939 law. The basic requirement was a written prescription. In 1946 section 1366a was newly entitled "Barbiturate and Other Hypnotic and Somnifacient Drugs" and was expanded to essentially its present form. In 1947 following a new revision of the Education Law, section 1366a was renumbered to section 6814. Minor changes were made in the phraseology of the section; and numbering of the subsections was standardized.

Section 6814 has continued to the present without change. It is dissimilar to the committee's recommendations in several respects:

1. It permits a prescription for barbiturates to be refilled unless it bears a direction to the contrary. If the prescriber fails to specify "not to be refilled" or an indication of the refillable time period, then the prescription may be refilled during a period of not more than 6 months. Furthermore, the prescription shall not be refilled prior to the end of the period for which the medication should last.

2. It carries no provision for the physician to dispense barbiturates directly to the patient.

3. It contains no provision requiring the pharmacist to keep records of bills for purchase of barbiturates; and,

4. It does not require manufacturers, wholesalers, and jobbers to maintain a record of amounts of barbiturates received, distributed, or sold.

Section 1747b of the Penal Law of New York State entitled "Sale or Possession of Barbiturate Drugs or Preparations" carries a penalty for unauthorized sale or possession of barbiturate drugs or preparations.

Other States

The Drafting Committee of the Council of State Governments drafted a model bill entitled "Hypnotic or Somnifacient (sleep-producing) Drugs Act" which appeared in its report on Suggested State Legislation Program for 1955. The council is the research and law writing agency of the Conference of State Governors which is held annually to consider methods of achieving greater economy and efficiency in State government. This model law is similar to the recommendations by the Committee on Public Health except in the following particulars: Although it requires that refilling of a prescription must be specifically

authorized, it does not specify a minimum interval between renewals, the total number of renewals, and the expiration date of the prescription. On the other hand, it includes a section on penalties. One of the provisions in the model law is similar to that recommendation of the Committee on Public Health which was not adopted in the Sanitary Code; namely, the physician must maintain records of barbiturates distributed by him.

In response to a questionnaire on the model law, the council heard from 34 out of 48 States. Alabama, California, Iowa, Maine, New Jersey, North Carolina, South Carolina, Texas, and Wisconsin indicated that legislation substantially similar to the draft of the model law was approved in each State prior to 1955. Indiana, Massachusetts, Montana, Nebraska, and Rhode Island have indicated that legislation substantially similar to the model act was passed during the 1955 legislative sessions.

Federal

Federal control over the sale of barbiturates is exercised by the United States Food and Drug Administration through application of the misbranded drug and device provisions of the Federal Food, Drug and Cosmetic Act of 1938, sections 502 and 503. Prior to 1951, Food and Drug Administration prosecutions for the sale of barbiturates without prescription rested on the charge of misbranding under section 502 which specified 10 types.

Of these the following four covered in section 502 (b), (d), (e), and (f) should be especially considered: A drug and device in packaged form shall be deemed to be misbranded:

1. Unless it bears a label containing the name and place of business of the manufacturer, packer, or distributor; and an accurate statement of the quantity of the contents.

2. Unless the label on a narcotic or hypnotic substance bears its name and quantity; and the statement "Warning—May be habit forming." By the terms of the section barbiturates are defined as habit forming.

3. If it is not designated solely by a name recognized in an official compendium, unless its label bears the common or usual name of the drug or each active ingredient, including the quantity or proportion of substances specified in the subsection.

4. Unless its labeling bears adequate directions for use and such adequate warnings against use in instances where it may be unsafe. Under the accompanying regulation of this fourth provision, shipment or delivery of prescription drugs, including barbiturates, were exempted if the label contained the statement "Caution: Federal law prohibits dispensing without prescription."

Section 503 (b) of the Federal Food, Drug and Cosmetic Act of 1938 provided that drugs dispensed on prescription were exempt from the first and third labeling requirements. This section further provided that if the prescription was marked non-refillable or refill was prohibited by law, the drug dispensed was exempt from the requirements that the label carry the name and quantity of narcotic or hypnotic substance, and the statement "Warning—May be habit forming."

In 1951 section 503 (b) was amended by the so-called Durham-Humphrey Act which replaced the previous provisions of that section. This new section provides essentially that:

1. A drug intended for use by man which:

(a) is a habit-forming drug to which section 502 (d) applies [narcotic and hypnotic substances]; or

(b) becauses of its toxicity or other potentiality for harmful effect, is not safe for use except under supervision of a practitioner licensed by law to administer such a drug; or

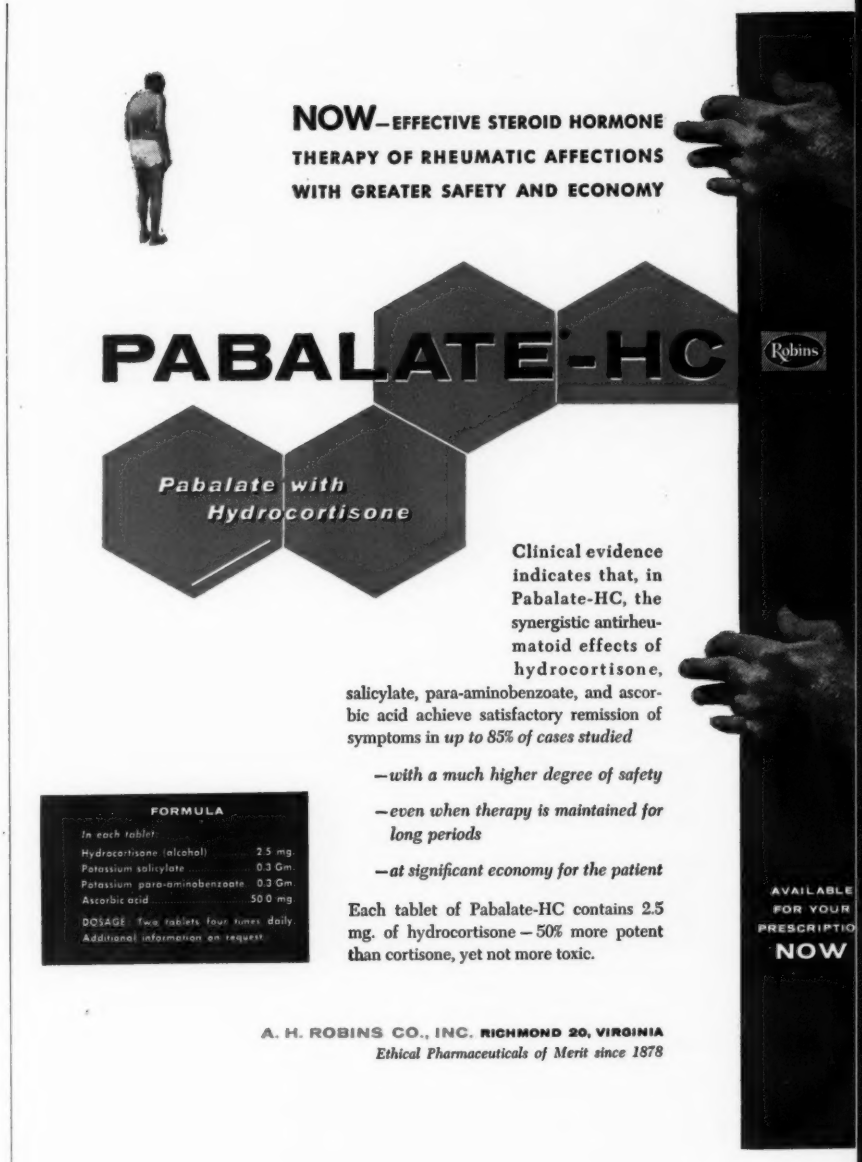
(c) is a new drug limited to use under the professional supervision of a practitioner by law to administer such a drug, shall be dispensed only:

(i) upon a written prescription, or

(ii) upon an oral prescription reduced promptly to writing and filed by the pharmacist, or

(iii) by refilling any written or oral prescription if the refilling is authorized by the prescriber either in the original prescription or by oral order which is reduced promptly to writing by the pharmacist.

A drug dispensed contrary to above provisions shall be deemed misbranded.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2. Any drug dispensed by filling or refilling a written or oral prescription of a practitioner licensed by law to administer such drug shall be exempt from misbranding as specified in section 502, except as to false and misleading labeling, imitation of another drug, substitution, and packaging requirements, if the drug bears a label containing the name and address of the dispenser, the serial number and date of the prescription or of its filling, the name of the prescriber, the name of the patient, the directions for use, and any cautionary statements contained in the prescription.

3. The administration may by regulation exempt habit forming drugs and new drugs from prescription requirements, when these are not necessary for the protection of public health.

4. A drug which is subject to the prescription requirement shall be deemed to be misbranded if at any time prior to dispensing its label fails to bear the statement: "Caution: Federal law prohibits dispensing without prescription." A drug not subject to prescription shall be deemed to be misbranded if at any time prior to dispensing its label bears the caution statement.

The United States Food and Drug Administration now uses section 503 (b) (1) in prosecuting violative sales of prescription drugs, including sales of barbiturates. It has been noted that the statement "Warning—May be habit forming" was formerly required on labels for both stock and dispensing containers of barbiturates except when the prescription was marked "nonrefillable" or its refilling was prohibited by law. Under revised section 503 (b) as provided in the Durham-Humphrey Act, barbiturates dispensed on legal prescription do not require the statement "Warning—May be habit forming" on the label of the dispensing container.

It will be noted that the Federal law, while placing barbiturates on the prescription list, controls their manufacture and distribution by specifications of misbranding. Except for the requirement of a prescription, this approach is separate and distinct from that recommended by the Committee on Public Health. Even in the requirement for a prescription, there is no restriction on refilling, such as the minimum interval, number of refillings, and the life of the prescription.

When the Durham-Humphrey Act went into effect in 1952, pharmaceutical associations and pharmacy boards in 11 States decided that the laws in their States which control the sale of drugs should be amended to bring them into conformity with the Federal statute. This action was proposed in order to eliminate the confusion to which druggists were subjected in operating under two conflicting statutes. The laws of these States were in conflict with the Federal Durham-Humphrey Act on one or both of two points: prohibition against refilling of barbiturate prescriptions, and against filling telephoned prescriptions, both of which are permitted under the Durham-Humphrey Act.

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flict, the stricter law prevails. Unaware of this, some pharmacists have thought that because the Federal law permits the refilling of barbiturate prescriptions and the filling of telephoned barbiturate prescriptions, such practices are proper even though the State law bans them. Harmonizing of the laws would end this confusion. In 20 States no amendment was needed to bring their laws into conformity with the Durham-Humphrey Act. Furthermore, the model State law on barbiturates does not conflict with Federal regulations.

DISCUSSION AND CONCLUSIONS

It is clear that the incidence of both fatal and nonfatal barbiturate poisoning is of such a magnitude that it constitutes a problem in public health. Because it includes poisoning both under accidental circumstances and from suicidal attempt, any plan for reduction must take cognizance of these two separate aspects. It is further evident that the rate of incidence is very much higher in New York City than in the United States.

As a solution to the barbiturate problem there has been a loud demand for Federal supervision, variously expressed as stiffer Federal laws, tighter Federal control over distribution. Federal regulations similar to those for narcotics. But both commercially and pharmacologically, barbiturates are dissimilar to narcotics. It should be remembered that narcotics come from a foreign source and that the basis of control is a revenue measure. In contrast, the barbiturates are domestically produced and the model act now in effect in some States and proposed for all is much stricter; in fact, it could not with reason be much more strict. Certainly the Harrison Act for narcotics is not appropriate for or applicable to barbiturates. If what is wanted is more restrictive Federal legislation because of seeming legal inadequacy in some States, the model act for States should be carefully studied before clamoring for a Federal panacea.

Another form of demand for Federal regulation is that the Narcotics Bureau be given enough money and personnel to carry out a program to control the manufacture, distribution, and sale of barbiturates. To place this responsibility on a bureau that is already overburdened with the gigantic task of coping with illicit narcotic traffic would add an additional handicap that would indeed be formidable. It is asserted that the Narcotics Bureau is most inadequately supported for its present work. Here again the present status of enforcement of existing State and city laws and the possibilities for the future might well be explored before turning the responsibility too quickly over to a Federal bureau.

It is the opinion of the committee that the model law for States to control barbiturates, which is patterned after its recommendations of 1945, is a highly effective legislative measure containing adequately restrictive provisions. The fault lies not in the terms of this law: indeed, it is much more restrictive and in its approach is capable of exerting much

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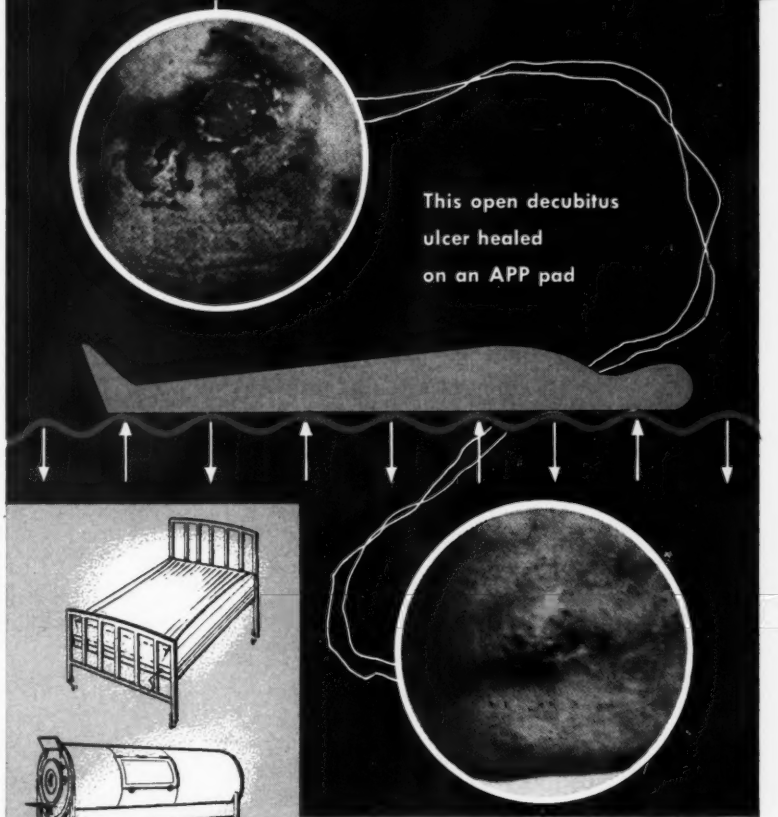

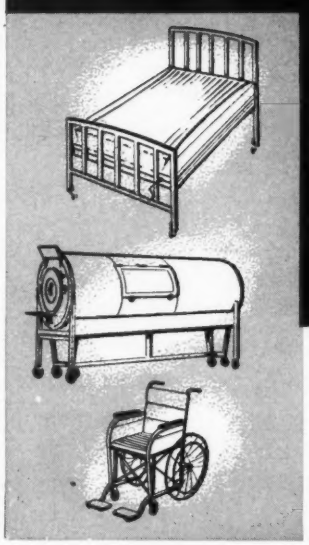

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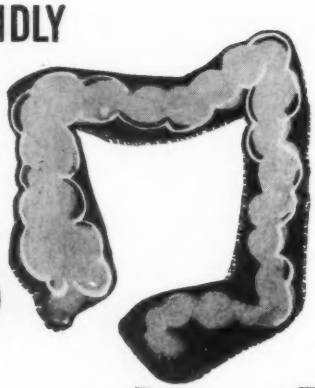

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more control than are the existing Federal statutes.

Rather, the present inadequacies in controlling barbiturates are of another kind. They are four in number: First, the model law has not been adopted by all; indeed, not by a majority of the States. This is not just a matter of gross negligence or apathy. It takes time to achieve legislative remedies for social problems. But before judging the adequacy of the model law and the capability of the States to control barbiturates through it, it would seem reasonable that the law be on the books. How can effective control be expected when only 13 States have adopted the measure? How can New York City enforce its model regulations to greatest effect, assuming that it had sufficient personnel, when the rest of New York State and some of the adjoining States are exempt? In view of the demonstrated magnitude of barbiturate poisoning in New York City, the blocking of these loopholes is important. Because of the apparent concentration of the barbiturate problem in urban areas, large cities with home rule in the various States should also have laws patterned after the model act.

Second, in those States which have accepted the model law, it has been so recently adopted that its enforcement has in all probability not reached the level that might be hoped for. But time is not the only reason. Even in new York City with its highly restrictive regulations in effect since 1947, it would require considerable temerity to argue that enforcement has been exemplary. Nor should the health department be criticized or censured. To examine properly the records of manufacturers, wholesalers, jobbers, and pharmacists requires an adequate staff of inspectors. For this the department has never had the necessary number of personnel. It has only 20 pharmacy inspectors, burdened with many other duties, to patrol 4,000 retail pharmacies and 500 jobbers, wholesalers, and packagers. It is absurd to demand more stringent laws when there is so little provision for enforcement of sufficiently strong existing measures in the Sanitary Code of New York City. More laws will not compensate for an insufficient number of inspectors.

Nor would a vast force be required. A reasonable number of inspectors engaged full time and regularly in auditing the records of pharmacies, wholesalers, and jobbers might soon instill honesty among all transactors, particularly if the element of surprise was utilized. By much the same system bank examiners have exercised a salutary influence. The problem of barbiturate poisoning in New York City has been shown to be proportionately much greater than it is in the Nation. Therefore, if the situation in New York City were improved, it would go far toward reducing the national incidence of barbiturate poisoning.

It is believed that the misuse of barbiturates is concentrated in urban areas, particularly large cities; accordingly, it follows that enforcement efforts should be concentrated there. For that a Fed-

eral Bureau is not needed.

Third, ignorance and a casual attitude have been the prevailing atmosphere surrounding barbiturates. The public has been unaware that this valuable family of hypnotics, like almost all other medication, is not without its dangers when misused. Those who know the risk of misuse, the physician and the pharmacist, have apparently not adequately informed or sufficiently impressed the patients about it.

Even after studying the figures on prevalence of use and misuse of barbiturates, the source of supply, and the legislative controls, the committee is convinced that it has not yet come to the core of the situation. Why is there widespread use and misuse of barbiturate-containing sedatives and sleeping pills? There must be a reason. That widespread practice must be symptomatic of an underlying condition. The committee can only come to the conclusion that there exists all too much unrest, anxiety, and tension in the public.

Under these circumstances, such a radical step as prohibiting the use of the therapeutically valuable barbiturates on the grounds that it would remove a means of self-destruction would not be a sensible action or a sure corrective. With equal reason it might be argued that all high bridges and buildings should be razed, and all gas lines should be disconnected. True, it is an imperative duty to throw every reasonable safeguard around the use of barbiturates. Nevertheless, that is not a true remedy which will bring effective and permanent relief. At best it is treating the symptoms of a disease, not its cause. Now perforce it is the main recourse.

But there must also be a more fundamental approach to the solution. What is needed is a means of preventing the prevalent unrest and anxiety. For that it is necessary to have knowledge about the causes of the emotional manifestations that so abound in society. Furthermore, effective prevention of suicide can come only through an understanding of the factors that bring about a morbid state that leads to a desire for self-destruction. Knowledge on these points can only come through research. Until recently the amount expended for research on mental and emotional disorders was so infinitesimally minute as to be insignificant. Even now the manpower and funds for investigations in this area are so limited in comparison with the transcendent importance of the subject as to make the need a clarion challenge.

In sum, the committee concludes that available model legislation is adequately restrictive, but it has not been widely enough adopted; where it has been put into effect, it has not been enforced. Moreover, such widespread usage of barbiturates can only indicate extensive unrest, anxiety, and tension in the people. The methods to prevent this situation are still unknown. Finally, the public's knowledge and the general attitude about barbiturates do not now appear to be conducive to a more temperate and reasonable use of barbiturates.

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RECOMMENDATIONS

As rational steps toward stopping the misuse of barbiturates and especially reducing the present high rate of incidence of barbiturate poisoning, the Committee on Public Health offers the following recommendations:

1. The model law controlling the manufacture and distribution of barbiturates should be adopted by all the States. Large cities with home rule should also have laws patterned after this act.

2. A realistic effort toward enforcement of the model law when enacted is an essential step. An adequate staff of inspectors to examine records should be organized. Efforts at enforcement should be concentrated on the large cities, where the rates of incidence of barbiturate poisoning are highest.

3. An educational campaign should be conducted by health departments, and medical and pharmaceutical societies to remind their members of their responsibility of acquainting patients with the dangers of misuse of barbiturates. At the same time there should be a campaign, using all media, to inform the public of the risks attached to the misuse of barbiturates.

4. Above all, it is highly desirable that adequate funds should be provided to support research on the causes of unrest, anxiety, and tension that are so prevalent among the population and are the basis for such great use and misuse of barbiturates.

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Books received

Books received for review during the period from December 5, 1956, to January 5, 1957, are listed below. Reviews will be published as space permits.

THE HEAD AND NECK IN ROENTGEN DIAGNOSIS. Volumes I-II. By Eugene P. Pendergrass, M.D., Professor of Radiology and Chairman of the Department of Radiology, University of Pennsylvania; and J. Parsons Schaeffer, M.D., Ph.D., Professor of Anatomy and Director of the Daniel Baugh Institute of Anatomy, Emeritus, Jefferson Medical College; and Philip J. Hodes, M.D., Professor of Radiology, University of Pennsylvania. Ed. 2. Cloth. Pp. 1,987, with illustrations. Price $37.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

ANATOMY AND PHYSIOLOGY FOR STUDENTS OF PHYSIOTHERAPY, Occupational Therapy and Gymnastics. By C. F. V. Smout, M.D., M.R.C.S., L.R.C.P., Professor of Anatomy, University of Birmingham; Examiner to the Chartered Society of Physiotherapy; and R. J. S. McDowall, M.D., D.Sc., Professor of Physiology, University of London, King's College. Ed. 3. Cloth. Pp. 493, with illustrations. Price $9.00. Williams & Wilkins Company, Mount Royal & Guilford Aves., Baltimore 2. 1956.

LESIONS OF THE CERVICAL INTERVERTEBRAL DISC. By R. Glen Spurling, M.D., Professor of Neurosurgery, University of Louisville School of Medicine, Louisville,

Kentucky. Cloth. Pp. 134, with illustrations. Price $4.75. Charles C Thomas, Publisher, 301-327 E. Lawrence Avenue, Springfield, Ill., 1956.

THE VISUAL FIELDS. A Textbook and Atlas of Clinical Perimetry. By David O. Harrington, A.B., M.D., F.A.C.S., Clinical Professor of Ophthalmology, University of California School of Medicine; Consultant in Ophthalmology, U.S. Veterans Administration Hospital, Fort Miley, San Francisco, Calif. Cloth. Pp. 327, with illustrations. Price $16.00. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1956.

PRACTITIONERS' CONFERENCES Held at The New York Hospital-Cornell Medical Center. Volume 5. Edited by Claude E. Forkner, M.D., F.A.C.P., Professor of Clinical Medicine, Cornell University Medical College; Attending Physician, The New York Hospital; Consultant in Medicine (Hematology), Roosevelt Hospital; Consultant in Internal Medicine, Bronx Veterans Administration Hospital. Cloth. Pp. 398, with illustrations. Price $6.75. Appleton-Century-Crofts, 35 West 32nd Street, New York 1, 1957.

YOU AND YOUR OPERATION. By Benjamin R. Reiter, M.D. Cloth. Pp. 150, with illustrations. Price $3.50. The MacMillan Company, 60 Fifth Avenue, New York 11, 1956.

THE NEGRO POTENTIAL. By Eli Ginzberg assisted by James K. Anderson, Douglas W. Bray, Robert W. Smuts. Cloth. Price $3.00. Pp. 144. Columbia University Press, Irvington-on-Hudson, N.Y., 1956.

CLINICAL ORTHOPAEDICS. By Anthony F. DePalma, Editor-in-Chief with the Assistance of the Associate Editors, the Board of Advisory Editors, and the Board of Corresponding Editors. Number Eight. Cloth. Pp. 337, with illustrations. Price $7.50. J. P. Lippincott Company, E. Washington Square, Philadelphia 5, 1956.

MORAL PROBLEMS IN HOSPITAL PRACTICE. A Practical Handbook. Originally by Patrick Finney, C.M. Revised and Enlarged by Patrick O'Brien, C.M., S.T.D. Cloth. Pp. 321. Price $4.75. B. Herder Book Company, 15-17 S. Broadway, St. Louis 2, 1956.

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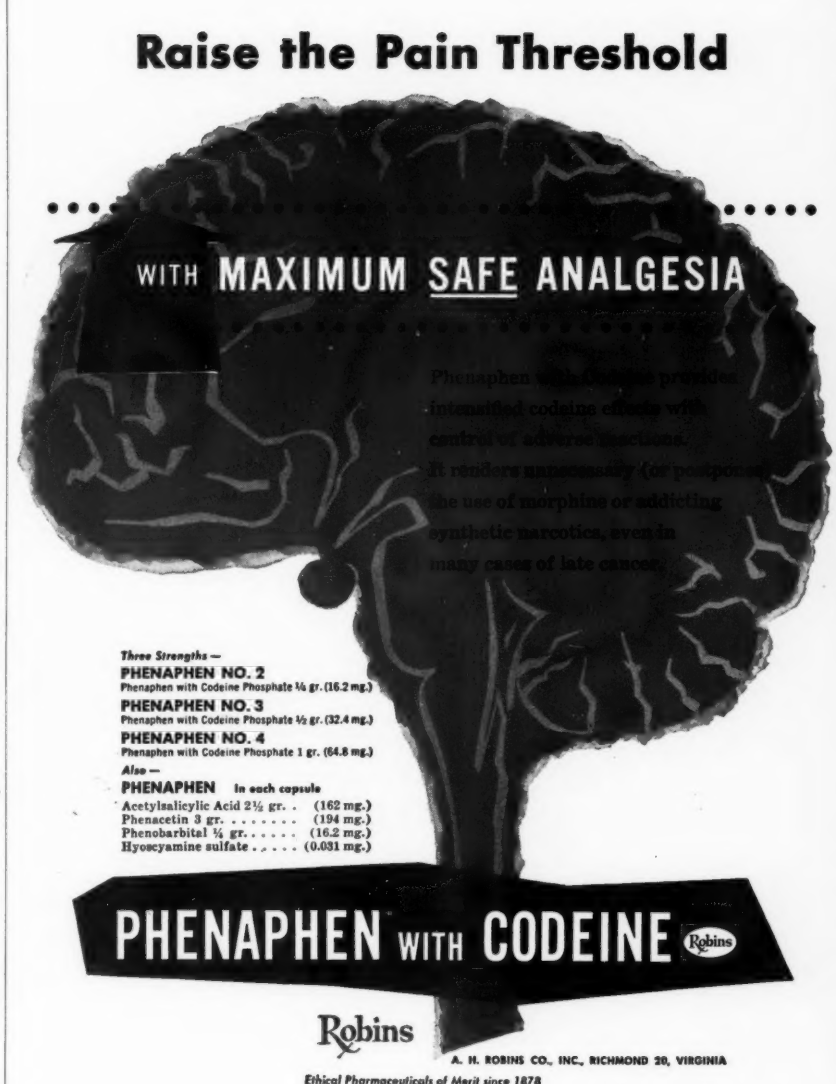
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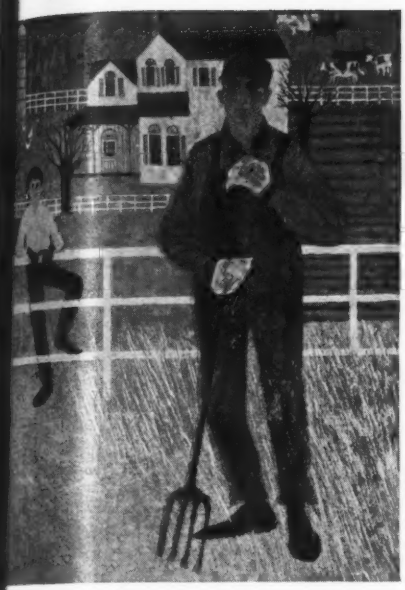

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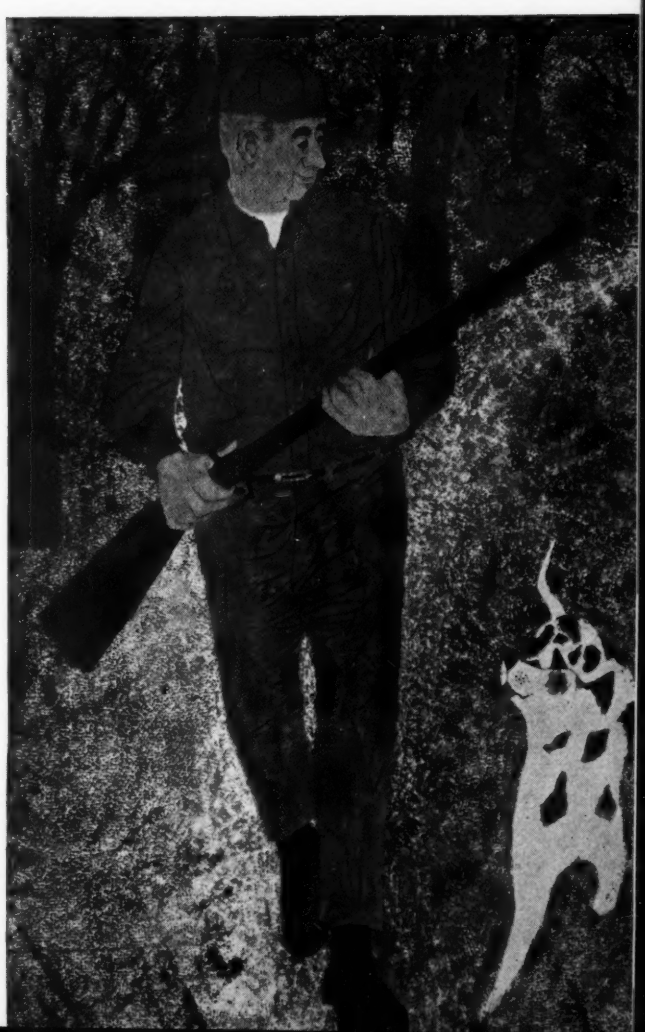

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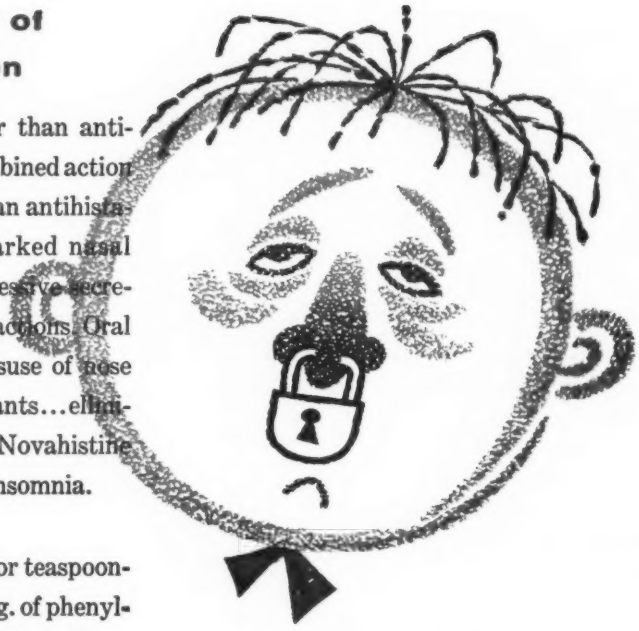

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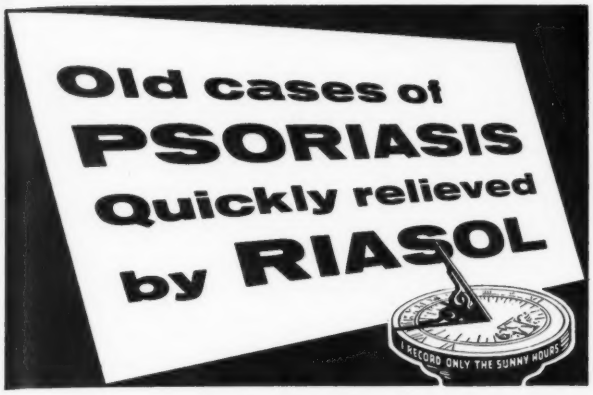

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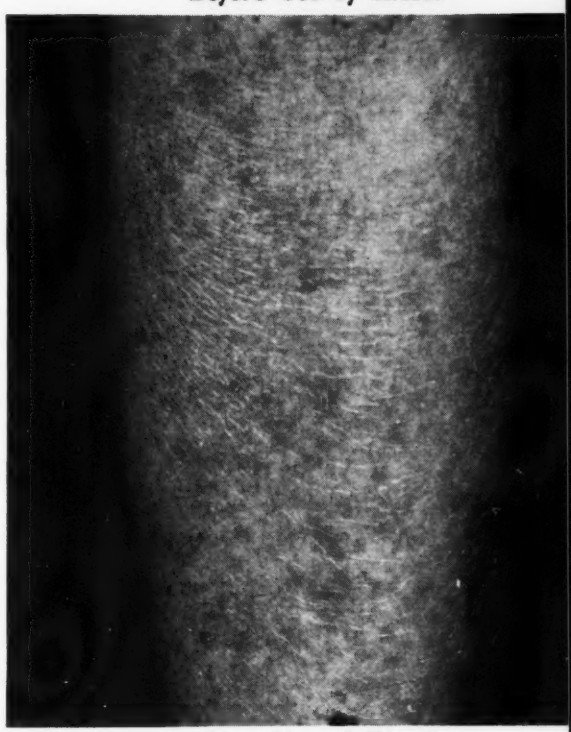

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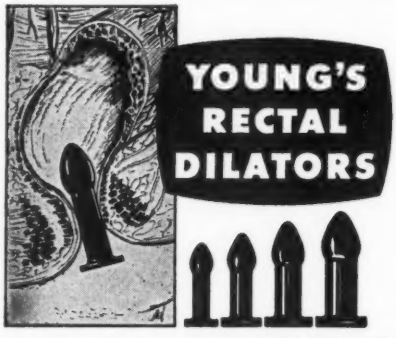

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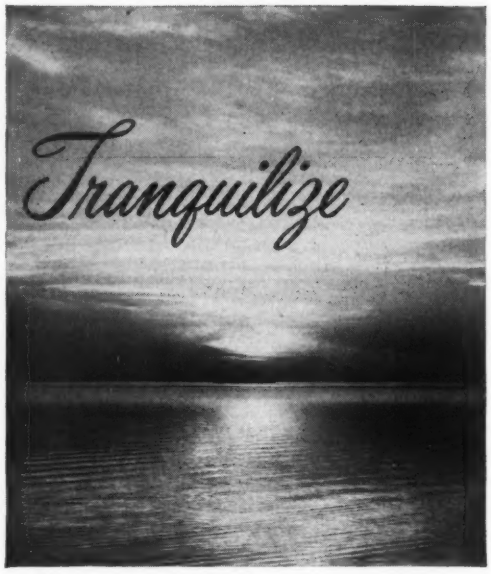

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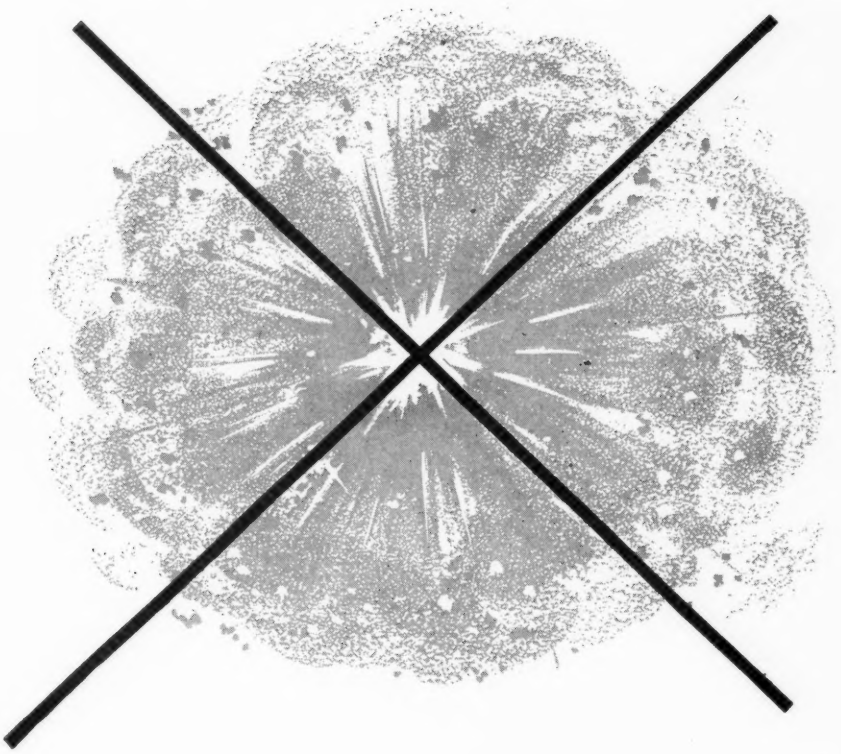

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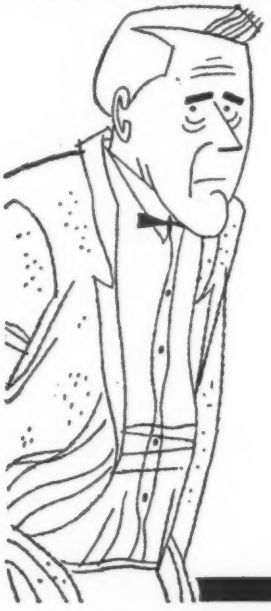

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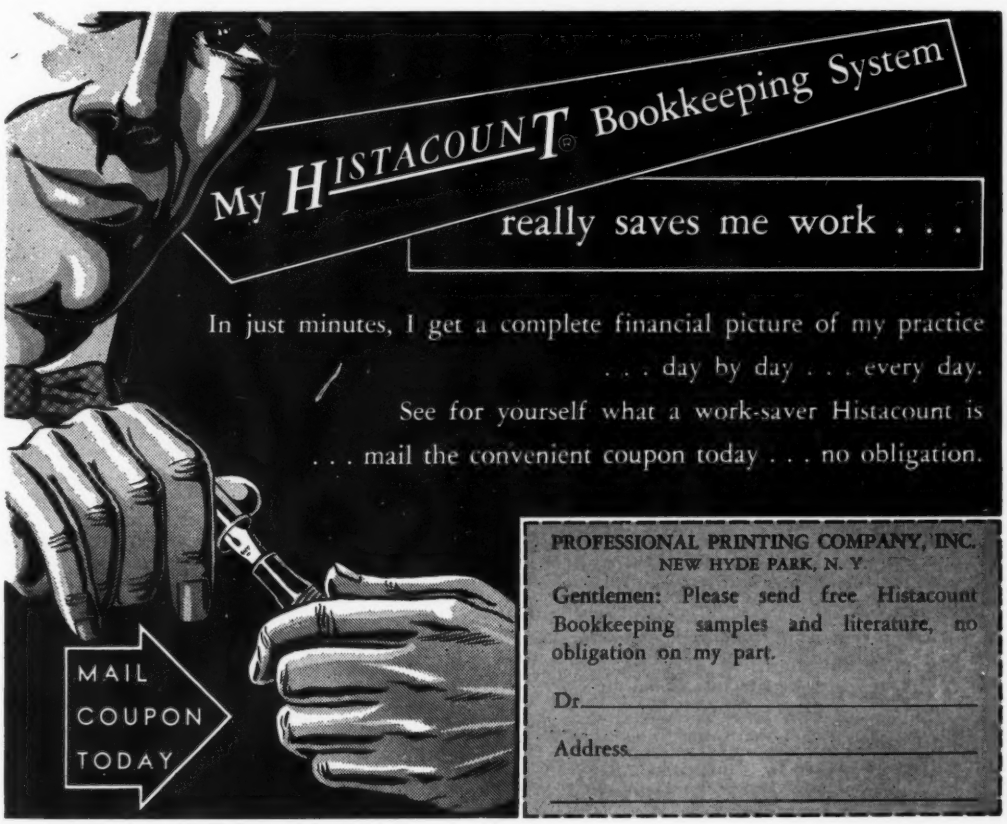
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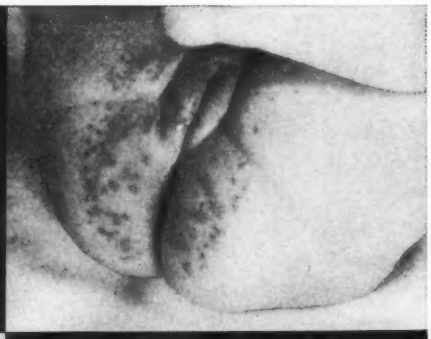

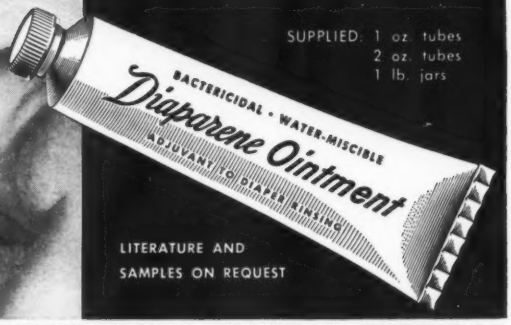

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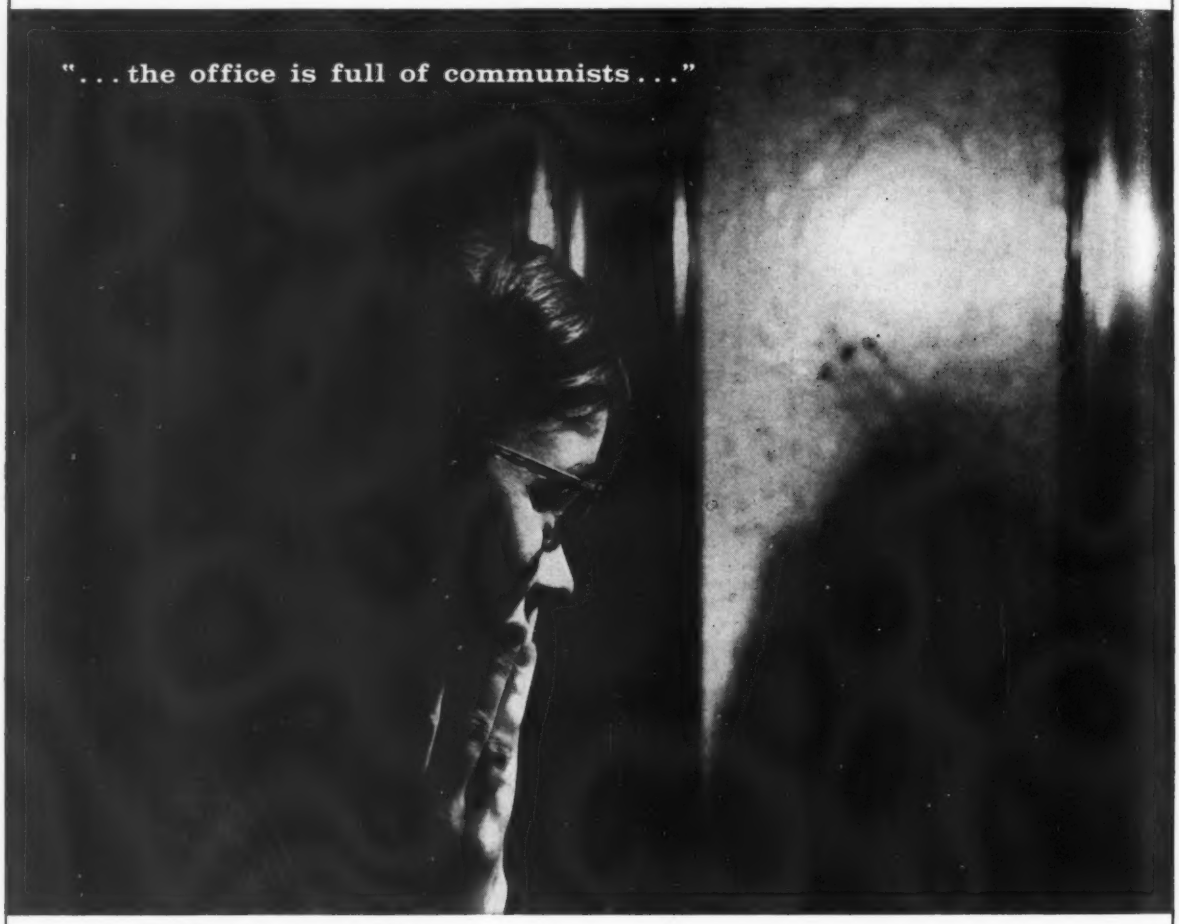

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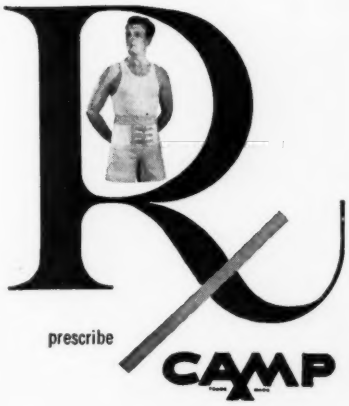

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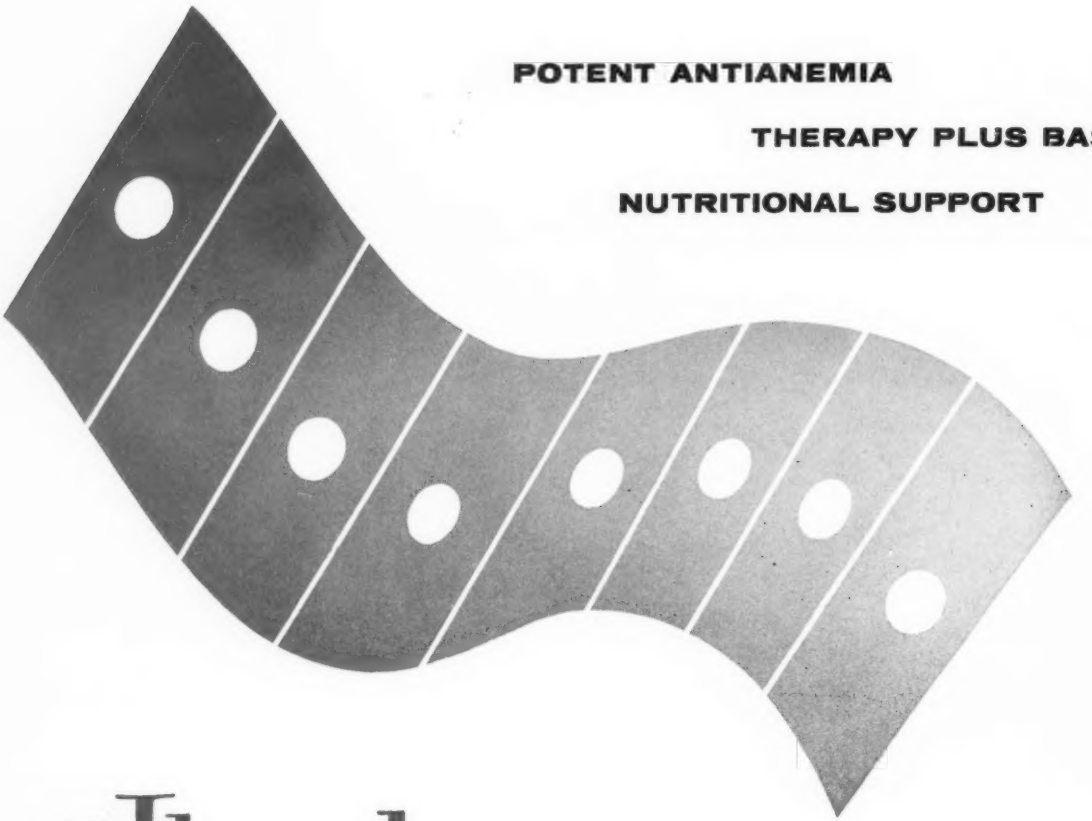

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1. Vilter, Richard W., Am. J. Clin. Nut., 3:72, Jan.-Feb., 1955

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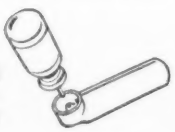
Medication and Adapter fit into neat plastic case, convenient for pocket or purse . . .

Medihaler

Means an unbreakable Oral Adapter—no movable parts—no glass to break—no rubber to deteriorate . . .



Medihaler

Means greater economy—no costly glass nebulizers to replace, and one or two inhalations usually suffices for prompt relief.

Medihaler

The Unique Measured-Dose Inhalation Method

In Asthma

For Rapid Relief of Acute or Continuing Bronchospasm

Medihaler-Epi®

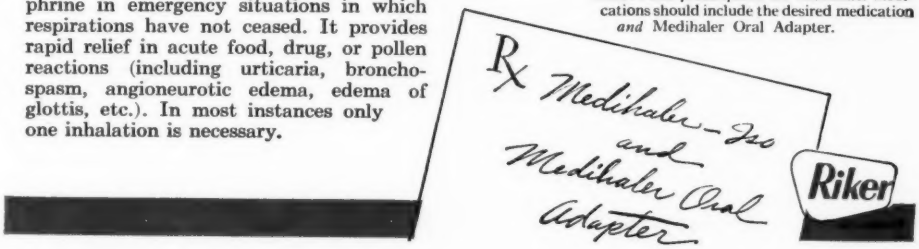
Riker brand of epinephrine 0.5% solution in inert, nontoxic aerosol vehicle. Each ejection delivers 0.125 mg. epinephrine. In 10 cc. vial with metered-dose valve, sufficient for 200 inhalations.

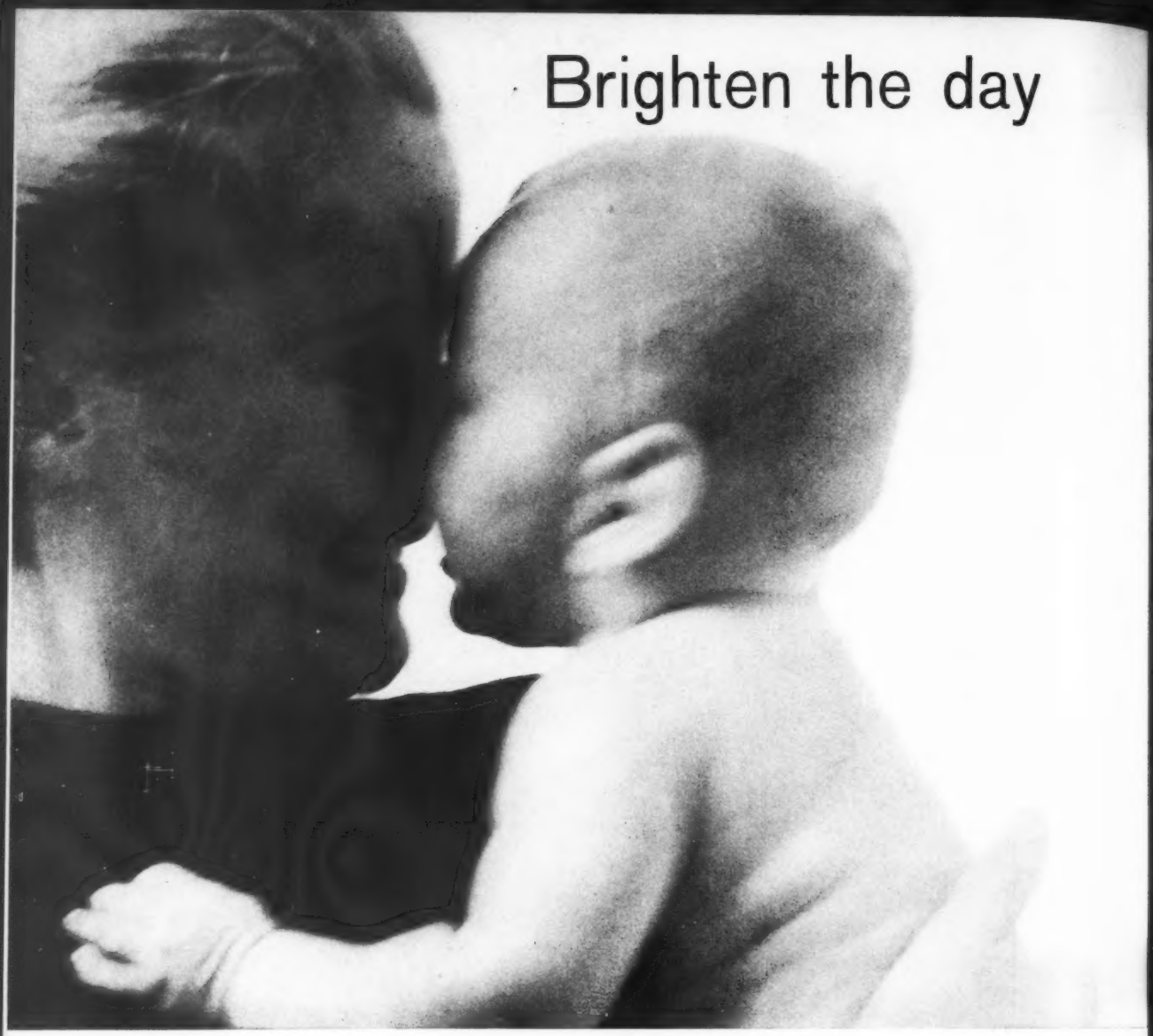
Medihaler-Epi replaces injected epinephrine in emergency situations in which respirations have not ceased. It provides rapid relief in acute food, drug, or pollen reactions (including urticaria, bronchospasm, angioneurotic edema, edema of glottis, etc.). In most instances only one inhalation is necessary.

Medihaler-Iso®

Riker brand of isoproterenol HCl 0.25% solution in inert, nontoxic aerosol vehicle. Each ejection delivers 0.06 mg. isoproterenol. In 10 cc. vial with metered-dose valve, sufficient for 200 inhalations.

Note: First prescription for Medihaler medications should include the desired medication *and* Medihaler Oral Adapter.





for the chronically fatigued, the chronically ill, the convalescent, the apathetic and depressed older patient, the postpartum patient, the oversedated, the retarded child with

Ritalin®

hydrochloride

(methylphenidate hydrochloride CIBA)

a new *mild* antidepressant, chemically unrelated to the amphetamines. Ritalin brightens outlook and renews vigor—counteracts drug sedative effects—often improves performance in the elderly. In most cases, Ritalin does not overstimulate, has little or no effect on appetite, blood pressure or pulse rate.

Average dosage: 10 mg. b.i.d. or t.i.d.

Supplied: TABLETS, 5 mg. (yellow), 10 mg. (light blue), 20 mg. (peach colored).

CIBA
SUMMIT, N. J.

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